Vol. 1022 Number 1

OFFICIAL GAZETTE

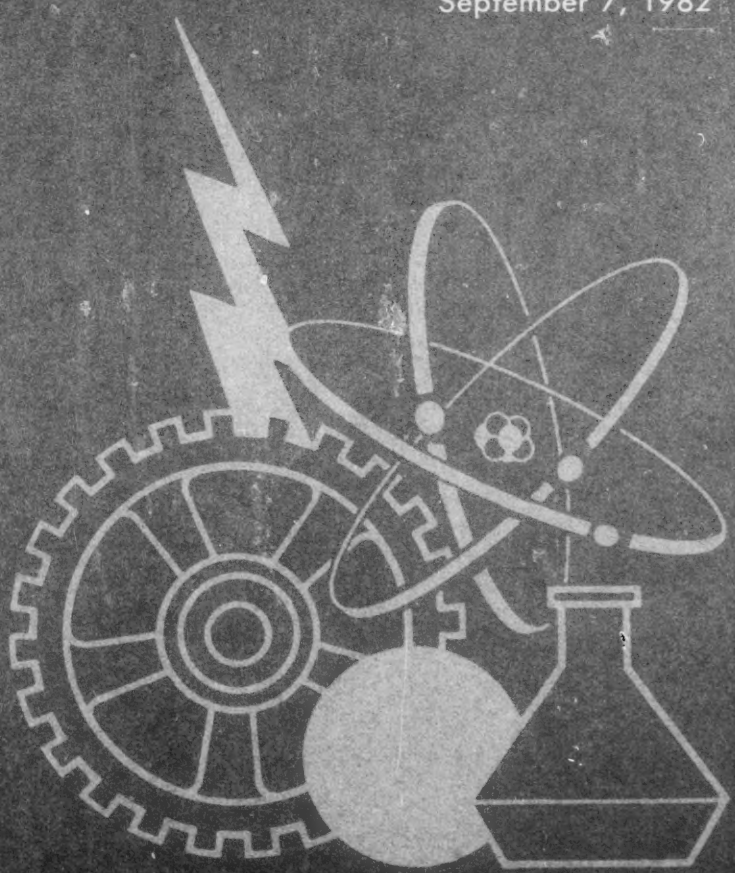
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

September 7, 1982



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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 7, 1982 **Volume 1022** **Number 1**

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of July 1982

Affirmed	231
Affirmed in Part	26
Reversed	63
Total	320

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,932,860, Re. S.N. 396,224, Filed July 8, 1982, Cl. 340/753, ELECTRO-OPTICAL DISPLAY WITH CIRCUITRY FOR APPLYING PREDETERMINED POTENTIALS TO ALL DISPLAY SEGMENTS TO EFFECT ACTIVATION OF A SELECTED SEGMENT ONLY, Sam G. Cohen, Owner of Record: *Timex Corp., Middlebury, Conn.,* Attorney or Agent: Joseph A. Biela, et al., Ex. Gp.: 234

4,186,248, Re. S.N. 392,714, Filed June 28, 1982, Cl. 429/191, SOLID STATE ELECTROLYTES, Geoffrey W. Mellors, Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 112

4,207,989, Re. S.N. 389,186, Filed June 16, 1982, Cl. 220/266, CONTAINER WITH LID OPENING MEANS, Ole Ingemann, Owner of Record: *A/S Haustrup Plastic, Langeskov, Denmark,* Attorney or Agent: Alan K. Roberts, et al., Ex. Gp.: 241

4,207,989, Re. S.N. 389,346, Filed June 17, 1982, Cl. 220/266, CONTAINER WITH LID OPENING MEANS, Ole Ingemann, Owner of Record: *A/S Haustrup Plastic, Langeskov, Denmark,* Attorney or Agent: Camil P. Spiecens, et al., Ex. Gp.: 241

4,211,672, Re. S.N. 384,966, Filed June 4, 1982, Cl. 252/455R, SUPPORTED CATALYST FOR PURIFYING GAS AND METHOD OF MANUFACTURING THE SAME, Kazunori Sonetaka, et al., Owner of Record: *Matsushita Electric Industrial Co., Ltd., Osaka, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 116

4,211,988, Re. S.N. 396,110, Filed July 7, 1982, Cl. 334/16, SEARCH TUNING SYSTEM FOR TELEVISION RECEIVER, Shigeo Matsuura, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 254

4,225,873, Re. S.N. 390,005, Filed June 18, 1982, Cl. 346/76.3, RECORDING AND PLAYBACK SYSTEM, John S. Winslow, Owner of Record: *MCA Disco-Vision, Inc., Universal City, Calif.,* Attorney or Agent: Ronald J. Clark, Ex. Gp.: 211

4,244,060, Re. S.N. 389,708, Filed June 18, 1982, Cl. 3/13, INTRAOCULAR LENS, Kenneth J. Hoffer, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 336

4,245,000, Re. S.N. 390,476, Filed June 21, 1982, Cl. 428/224, VISCOSE RAYON, Gregory C. Bockno, Media, Pa., Owner of Record: *Avtex Fibers, Inc., Valley Forge, Pa.,* Attorney or Agent: Arthur R. Eglington, Ex. Gp.: 164

4,276,129, Re. S.N. 393,033, Filed June 28, 1982, Cl. 204/58, METHOD FOR PRODUCING FOIL ELECTRODES FOR ELECTROLYTIC CAPACITOR, Nobuyoshi Kanzaki, et al., Owner of Record: *Matsushita Electric Industrial Co., Ltd., Osaka, Japan,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 112

4,276,565, Re. S.N. 384,538, Filed June 3, 1982, Cl. 358/140, METHOD AND APPARATUS FOR STANDARDS CONVERSION OF TELEVISION SIGNALS, Christopher John Dalton, et al., Owner of Record: *British Broadcasting Corp., London, England,* Attorney or Agent: Robert F. O'Connell, et al., Ex. Gp.: 233

4,282,111, Re. S.N. 396,207, Filed July 8, 1982, Cl. 252/178, HYDROQUINONE AS AN OXYGEN SCAVENGER IN AN AQUEOUS MEDIUM, Stanley J. Ciuba, Owner of Record: *Betz Laboratories, Inc., Trevose, Pa.,* Attorney or Agent: Alexander D. Ricci, et al., Ex. Gp.: 166

4,283,280, Re. S.N. 392,896, Filed June 28, 1982, Cl. 210/198.200, CARTRIDGE TYPE SEPARATION COLUMN AND HOLDER ASSEMBLY FOR LIQUID CHROMATOGRAPHS, Robert Brownlee, Owner of Record: *Inventor,* Attorney or Agent: Robert B. Block, et al., Ex. Gp.: 176

4,298,001, Re. S.N. 388,923, Filed June 16, 1982, Cl. 128/247, FLUID FLOW CONNECTOR UNIT AND METHOD, Thomas S. Hargest, et al., Owner of Record: *Inventors,* Attorney or Agent: Wellington M. Manning, Jr., et al., Ex. Gp.: 335

4,305,328, Re. S.N. 388,509, Filed June 14, 1982, Cl. 99/283, COFFEE VENDOR, John J. Kueser, et al., Owner of Record: *UMC Industries, Inc., St. Louis, Mo.,* Attorney or Agent: Irving Powers, et al., Ex. Gp.: 242

4,315,907, Re. S.N. 395,856, Filed July 6, 1982, Cl. 424/1, COMBINED HETEROGENEOUS SPECIFIC BINDING ASSAY, Bertold Fridlender, et al., Owner of Record: *Ames-Yissum, Ltd., Jerusalem, Israel,* Attorney or Agent: Louis E. Davidson, et al., Ex. Gp.: 223

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the

requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,449,280, Reexam. No. 90/000,236, Requested: Aug. 2, 1982, Cl. 523/402, ADHESIVE COMPOSITION CONTAINING HIGH MOLECULAR WEIGHT POLYAMIDES EPOXY RESINS AND CURING AGENTS, Robert A. Frigstad, Owner of Record: *Minnesota Mining & Manufacturing Co., St. Paul, Minn.,* Attorney or Agent: Carpenter, Kinney & Coulter, Ex. Gp.: 144, Requester: James S. Womack, Sheldahl, Inc. Northfield, Minn.

3,736,036, Reexam. No. 90/000,235, Requested: Aug. 2, 1982, Cl. 312/285, STORAGE SYSTEM FOR TAPE CASSETTES, Gregory Mathus, Owner of Record: *Data Packaging Corp.,* Attorney or Agent: George L. Greenfield, Ex. Gp.: 350, Requester: Hartzell Manufacturing Co., St. Paul, Minn.

3,956,667, Reexam. No. 90/000,237, Requested: Aug. 4, 1982, Cl. 315/169, LUMINOUS DISCHARGE DISPLAY DEVICE, Werner Veith, Owner of Record: *Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany,* Attorney or Agent: Hill, Van Santen, Steadman, Chiara & Simpson, Ex. Gp.: 250, Requester: Owner of Record

4,096,202, Reexam. No. 90/000,241, Requested: Aug. 11, 1982, Cl. 525/64, IMPACT MODIFIED POLY (ALKLENE TEREPHTHALATES), Sutton B. Furnham, et al., Owner of Record: *Rohm & Haas Co., Philadelphia, Pa.,* Attorney or Agent: Michael B. Fein, Ex. Gp.: 140, Requester: Frank E. Robbins, Washington, D.C.

4,145,185, Reexam. No. 90/000,239, Requested: Aug. 5, 1982, Cl. 23/230B, REAGENTS FOR SCREENING TESTS AND BIOASSAY OF VON WILLIEBRAND'S FACTOR (PLATELET AGGREGATING FACTOR) IN BLOOD PLASMAS, Kenneth M. Brinkhous, et al., Owner of Record: *Research Triangle Institute, Research Triangle Park, N.C.,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 170, Requester: Owner of Record

4,287,087, Reexam. No. 90/000,240, Requested: Aug. 5, 1982, Cl. 252/408, FIXED-DRIED BLOOD PLATELETS, Kenneth M. Brinkhous, et al., Owner of Record: *Research Triangle Institute, Research Triangle Park, N.C.,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 223, Requester: Owner of Record

4,295,096, Reexam. No. 90/000,238, Requested: Aug. 5, 1982, Cl. 324/357, ELECTRODE PROSPECTING METHOD PROVIDING CALCULABLE ELECTROMAGNETIC COUPLING FOR THE INDIRECT DETECTION OF HYDROCARBON RESERVOIRS, Ben K. Sternberg, et al., Owner of Record: *Conoco, Inc., Ponca City, Okla.,* Attorney or Agent: William J. Miller, Ex. Gp.: 252, Requester: Owner of Record

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Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

B & W Enterprises, Tulsa, OK, Reg. No. 1,127,706, for the mark "THE PIZZA OVEN", Can. No. 13,029.

Compressed Concrete Corp., Lake Worth, FL, Reg. No. 745,052, for the mark "SHADOWSTONE", Can. No. 13,123.

Parfums Schiaparelli, Inc., New York, NY, Reg. No. 397,252, for the mark "SILENCE", Can. No. 13,180.

The Hampton Corp., assignee of Marilyn Shoe Co., Milwaukee, WI, Reg. No. 599,386, for the mark "KICKERINOS ALASKAN", Can. No. 13,232.

California Spice & Vegetable Products, Inc., King City, CA, Reg. No. 1,061,806, for the mark "PRIDE OF CALIFORNIA", Can. No. 13,269.

Steri Pierce, Inc., Manassas, VA, Reg. No. 1,140,318, for the mark "SOFTOUCH", Can. No. 13,294.

Appendagez, Inc., Canton, MA, Reg. No. 992,894, for the mark "FADED GLORY", Can. No. 13,340.

Novo Airfreight Corp., New York, NY, Reg. No. 921,738, for the mark "AIRTRAC", Can. No. 13,196.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner For Trademarks.

Examiner Education Program Contributions Tax Deductible

The Internal Revenue Service has issued a ruling that financial contributions made in support of the Patent Examiner Education Program are tax deductible for the taxable year in which the contributions are made. The ruling is reproduced below.

July 20, 1982.

Dear Mr. Mossinghoff:

This is in reply to your request for a ruling whether contributions to your office under the following circumstances are deductible under section 170 of the Internal Revenue Code.

The Patent and Trademark Office of the Department of Commerce is promoting a Patent Examiner Education Program, which will improve the capabilities of its patent examiners to make decisions on patentability. That, in turn, will improve the quality of patents issued by the Office. Private industry is being asked to provide the funds for the Program because funds are not available from Congressional appropriations or fees received by the Office. Industry is also being asked to make commercial facilities available for visits under the Program. It is not necessary that a person who makes a facility available for visits also make a financial contribution. The identification of donors and gift amounts will be known to about four individuals in the Office. Neither the examiners nor the individuals assigning examiners to visit industrial facilities will know the donors or amounts of their gifts. Donors to the Program will not have any part in the assignment of examiners to visit the facilities.

Section 170 of the Code provides, subject to certain limitations, a deduction for contributions and gifts to or for the use of organizations described in section 170(c), payment of which is made within the taxable year.

Section 170(c)(1) of the Code provides, in part, that the term "charitable contribution" means a contribution or gift to or for the use of the United States, but only if the contribution or gift is made for exclusively public purposes.

The term "charitable contribution," as used in section 170 of the Code, requires a contribution or gift. A contribution or gift, for the purposes of section 170, is a voluntary transfer of money or property made by the transferor without receipt or expectation of financial or economic benefit. If the transferor receives, or can reasonably expect to receive, sufficiently substantial financial or economic benefits in excess of those that would inure to the general public, no deduction under section 170 is allowable. *United States* v. *Transamerica Corp.,*

392 F.2d 522 (9th Cir. 1968); and *Singer Co.* v. *United States*, 449 F.2d 413 (Ct. Cl. 1971).

Rev. Rul. 69-90, 1969-1 C.B. 63, holds that voluntary payments by merchants and property owners to a city to provide unrestricted public parking facilities located in the general area of the donors' businesses and properties are charitable contributions. This conclusion is based on the fact that the payments were not consideration for an agreement on the part of the city to provide parking facilities for the use of the contributors. The parking spaces were for the use of the general public and the amount of the contributions was not based on proximity or probable use. Thus, there was no special economic benefit conferred on the contributor by reason of the contribution.

In Rev. Rul. 73-296, 1973-2 C.B. 67, the Service considered whether contributions to United States Army Unit Funds, which are integral parts of the Army, are deductible under section 170 of the Code. The Funds could accept contributions if acceptance was found to be in the best interest of the Army and did not involve the granting of special privileges to the donor. The revenue ruling concludes that contributions to the Funds under these circumstances are deductible as contributions to or for the use of the United States under section 170, provided the contributions are for exclusively public purposes.

Contributions to the Program do not confer special privileges on the donors. The contributions provide funds for a program for which funds are not available from Congressional appropriations.

Accordingly, amounts contributed to the Program are deductible under section 170 of the Code, subject to the limitations provided by that section, as contributions to or for the use of the United States, provided the contributions are used exclusively for public purposes.

Sincerely yours,

Anthony Manzanares, Jr.,
Chief, Individual Income Tax Branch

The Patent Examiner Education Program, conducted jointly by the U.S. Patent and Trademark Office and Intellectual Property Owners, Inc., is described in the notice published in the Official Gazette of May 25, 1982, 1018 OG 39.

DONALD J. QUIGG,
Aug. 3, 1982 *Deputy Commissioner of Patents and Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 7, 1982

Re. 30,820	4,264,299	4,318,180	4,332,327
Re. 30,843	4,264,484	4,318,558	4,332,514
Re. 30,908	4,265,915	4,318,703	4,332,720
D. 262,492	4,266,222	4,318,880	4,332,812
D. 264,188	4,266,271	4,318,968	4,332,820
3,683,654	4,269,671	4,319,412	4,332,896
3,764,571	4,272,431	4,320,751	4,332,942
3,878,225	4,275,061	4,320,959	4,333,068
4,022,654	4,275,588	4,321,214	4,333,091
4,075,669	4,276,293	4,321,511	4,333,120
4,097,489	4,281,799	4,322,399	4,333,129
4,102,779	4,287,426	4,322,456	4,333,318
4,123,147	4,290,953	4,323,297	4,333,479
4,145,736	4,291,178	4,323,331	4,333,706
4,147,090	4,293,047	4,323,665	4,334,096
4,156,021	4,295,197	4,323,841	4,334,169
4,158,856	4,297,279	4,324,713	4,334,285
4,165,561	4,299,459	4,325,125	4,334,802
4,166,972	4,299,953	4,325,152	4,335,071
4,169,868	4,301,222	4,325,372	4,335,306
4,169,999	4,303,453	4,325,808	4,335,385
4,181,611	4,303,876	4,325,974	4,335,871
4,184,875	4,303,880	4,326,236	4,336,094
4,191,486	4,304,448	4,326,311	4,336,854
4,197,451	4,304,679	4,326,519	4,337,018
4,214,207	4,305,646	4,326,805	4,337,173
4,217,259	4,305,943	4,326,837	4,337,255
4,226,753	4,306,438	4,327,562	4,337,338
4,234,768	4,306,688	4,327,939	4,337,621
4,236,802	4,306,707	4,328,036	4,337,635
4,237,846	4,307,918	4,328,053	4,337,705
4,238,593	4,309,927	4,328,113	4,337,706
4,241,071	4,311,763	4,328,176	4,337,729
4,243,133	4,312,497	4,328,244	4,337,823
4,245,003	4,312,782	4,328,292	4,337,867
4,248,509	4,312,809	4,328,316	4,338,034
4,250,387	4,312,967	4,328,772	4,338,074
4,251,564	4,314,167	4,329,060	4,338,199
4,251,692	4,314,191	4,329,578	4,338,921
4,252,561	4,314,728	4,329,817	4,338,929
4,252,791	4,315,003	4,329,950	4,339,214
4,257,778	4,315,205	4,330,029	4,339,265
4,258,148	4,315,367	4,330,142	4,339,496
4,260,764	4,316,984	4,330,196	
4,263,170	4,317,232	4,331,231	
4,263,179	4,317,390	4,331,601	

Disclaimers

3,456,310.—*Fujio Abe* and *John V. Cauthen,* Fayetteville, and *Daniel W. McCoy,* Monroe, N.C. APPARATUS FOR STOPPING TEXTILE MACHINERY UPON DETECTION OF YARN-BREAK AND FOR INDICATING LOCATION THEREOF. Patent dated July 22, 1969. Disclaimer filed Oct. 31, 1980, by the assignee, *Burlington Industries, Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,522,704.—*Lyle S. Martin,* La Salle, Ill. HYDROSTATIC TRANSMISSION. Patent dated Aug. 4, 1970. Disclaimer filed May 20, 1981, by the assignee, *Sundstrand Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,030,881.—*Violet Boyd, Brian R. Fishwick* and *Brian Glover,* Manachester, England. COLORATION PROCESS. Patent dated June 21, 1977. Disclaimer filed Dec. 28, 1979, by the assignee, *Imperial Chemical Industries Ltd.*

Hereby enters this disclaimer to all claims of said patent.

4,076,642.—*John F. Herber,* St. Louis, *William R. Richard, Jr.* and *Robert W. Street,* Kirkwood, Mo. NOVEL MONOEPOXY COMPOUNDS AS ACID SCAVENGERS IN FUNCTIONAL FLUIDS. Patent dated Feb. 28, 1978. Disclaimer filed July 16, 1982, by the assignee, *Monsanto Co.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 5 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 24, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-18-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-13-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-09-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-20-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	4-09-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	7-07-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-14-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-27-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	5-24-82
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-27-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,192,536 to 3,197,783, inclusive

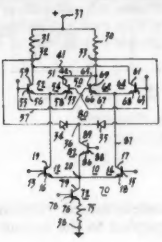
Plant Patents ..... Numbers 2,543 to 2,545 inclusive

REEXAMINATIONS

SEPTEMBER 7, 1982

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 3,651,418 (14th)
SYNCHRONOUS DETECTOR CONTROL
Erwin Johann Wittman, North Plainfield, N.J. assignor to RCA Corporation, Princeton, N.J.
Reexamination Request No. 90/000,079, Oct. 2, 1981.
Reexamination Certificate for Patent No. 3,651,418, issued Mar. 21, 1972, Ser. No. 89,583, Nov. 16, 1970.
U.S. Cl. 329/50 **Int. Cl.[3] H03D 3/18**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2, 4, and 6, having been finally determined to be unpatentable, are cancelled.

Claims 3, 5, and 8 are determined to be patentable, as amended.

Claims 7 and 9, dependent on amended claims 3 and 8, are determined to be patentable.

3. [The improvement of claim 1] *In a synchronous detector including a differential amplifier section formed from two transistors having a pair of base electrodes between which information containing input signals are applied, a pair of collector electrodes at which corresponding intermediate signals are developed for coupling to a synchronous switching section also included within the detector to provide demodulated output signals representative of said information, and a pair of emitter electrodes coupled to a current source section further included within the detector to supply substantially constant quiescent current to said amplifier section and from said amplifier section to said switching section, the improvement comprising:*

means controllably reducing the magnitude of the demodulated output signal provided by said synchronous switching section without substantially affecting the magnitude of the direct voltage developed thereat, said means including:

a. a first terminal coupled to said current source section;

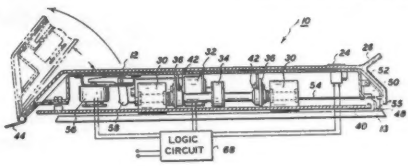
b. a second terminal coupled to said synchronous switching section; and

c. a third terminal coupled to receive an externally applied signal for controlling the conductivity between said first and second terminals to divert quiescent current flow from said current source section through said means and away from said differential amplifier section to desirably reduce the magnitude of the intermediate signals developed by said amplifier section and the magnitude of the demodulated output signal provided by said synchronous switching section, but having a tendency to reduce the magnitude of the quiescent current supplied from said amplifier section to said synchronous switching section to undesirably reduce the direct voltage developed thereat;

said second terminal being coupled, however, to receive said diverted quiescent current for subsequent reinsertion within said synchronous switching section with said reduced magnitude quiescent current from said differential amplifier section in a direction to offset said undesirable reduction in direct voltage and to maintain the total quiescent current in said switching section substantially constant in the presence of such signal magnitude reductions;

wherein said second terminal is coupled to reinsert said diverted quiescent current at an input terminal of said synchronous switching section to which said corresponding intermediate signals are coupled.

B1 3,888,582 (15th)
SEMI-AUTOMATIC DOCUMENT HANDLER
Augustus W. Griswold, Rush, N.Y., assignee to Xerox Corporation, Stamford, Conn.
Reexamination Request No. 90/000,062, Sep. 2, 1981.
Reexamination Certificate for Patent No. 3,888,582, issued Jun. 10, 1975, Ser. No. 449,307, Mar. 8, 1974.
U.S. Cl. 355/69 **Int. Cl.[3] G03B 27/76**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 2, 3, 5, 6, and 7 is confirmed.

Claims 1 and 4 are determined to be patentable as amended.

1. In a copying apparatus with a document copying platen and an overlayable platen cover holding documents against the platen for copying, the improvement comprising:

platen cover latching means for retaining said platen cover over said platen for the copying of documents on said platen,

said latching means comprising a permanent magnetic latch between said platen cover and said copying apparatus which can be manually unlatched *at any time* merely by manual lifting of said platen cover,

said latching means [including] *further comprising* automatic unlatching means for automatically unlatching said platen cover subsequently to the completion of said copying of documents on said platen,

said copying apparatus further including automatic platen cover lifting means for automatically lifting said platen cover away from said platen when said latching means is unlatched, and

wherein said automatic unlatching means comprises electrically driven mechanical camming means forcibly camming said platen cover away from said copy-

ing apparatus sufficiently to slightly separate and unlatch said permanent magnetic latch so that said automatic platen cover lifting means lifts said platen cover away from said platen subsequent to the completion of said copying of documents on said platen.

B1 3,187,234 (16th)

SELECTIVE SIGNAL-RESPONSIBLE CIRCUIT

Dwight M. Muranaka; Yujiro Yamamoto; Edwin S. Hamberg; all of Santa Ana, Calif., and Lindy T. Ikegami, Anaheim, Calif., assignors to Y 2 Associates, Inc., Santa Ana, Calif.

Reexamination Request No. 90/000,010, Jul. 1, 1981.
Reexamination Certificate for Patent No. 3,187,234, issued Jun. 1, 1965, Ser. No. 236,384, Nov. 8, 1962.
U.S. Cl. 361/182 Int. Cl.[3] H01H 47/20

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

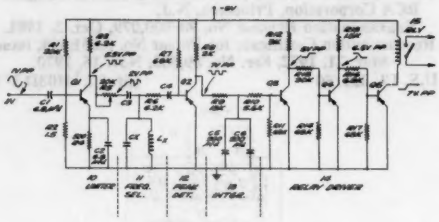
The patentability of claims 1–3 is confirmed.

1. An electrical circuit for responding to a signal of a predetermined frequency having at least a predetermined amplitude for at least a predetermined period of time, said circuit comprising, in combination:

an amplitude limiting circuit for receiving an incoming signal;

a frequency selection circuit coupled to the output of said amplitude limiting circuit;

a peak detector circuit coupled to the output of said frequency selection circuit, and operable for amplifying only such portion of each cycle of the signal as



exceeds a predetermined reference amplitude level;

an integrator coupled to the output of said peak detector circuit;

and a relay driver having an input coupled to said integrator to be actuated thereby.

DEFENSIVE PUBLICATIONS

PUBLISHED SEPTEMBER 7, 1982

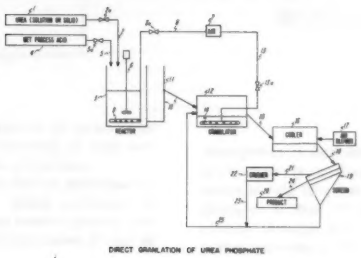
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T102,201
GRANULATION OF UREA PHOSPHATE FROM UREA AND MERCHANT-GRADE PHOSPHORIC ACID

Cecil P. Harrison, Rte. 7, Florence, Ala. 35630

Filed Nov. 16, 1981, Ser. No. 322,096
Int. Cl.[3] C05B *15/00;* C05C *9/00*
U.S. Cl. 71—29
1 Sheets Drawing. 19 Pages Specification



DIRECT GRANULATION OF UREA PHOSPHATE

A process for direct granulation of unpurified urea phosphate from urea or urea solution and merchant or filter grade wet-process phosphoric acid to produce a product with exceptional satisfactory physical and chemical properties for direct application to the soil or for use in production of fluid fertilizers. The process involves the utilization of sweep air in both the reactor and the granulator to remove water from the heat sensitive urea phosphate mixture to cause granulation of the product. The requirement for product drying with applied heat after granulation is eliminated. The process may be used for producing urea-urea phosphate provided certain precautions are taken to minimize hydrolysis of urea to prevent the resultant ammonia which in turn will react with the acid to form monoammonium phosphate.

DEFENSIVE PUBLICATIONS

REISSUES

SEPTEMBER 7, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

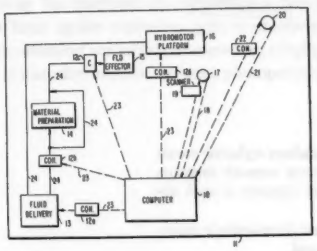
Re. 31,023
HIGHLY AUTOMATED AGRICULTURAL PRODUCTION SYSTEM

Arthur D. Hall, III, Port Deposit, Md., assignor to Advanced Decision Handling, Inc., Port Deposit, Md.

Original No. 4,015,366, dated Apr. 5, 1977, Ser. No. 567,322, Apr. 11, 1975. Application for reissue Mar. 2, 1979, Ser. No. 16,845

Int. Cl.³ A01D *46/00;* **A01G** *27/00, 13/00*

U.S. Cl. 47—1 R **97 Claims**



89. A computerized system for the production of agricultural products in an agricultural area which comprises at least one homogeneous agricultural area, said system comprising:

(a) sensing means for sensing at least one desired parameter in said homogeneous agricultural area, which parameter is necessary to achieve desired agricultural product growth, and for generating a sensor data output representative of said at least one parameter;

(b) a plurality of different controlled means each operative in response to a different respective control signal and functioning together to produce a desired change in said at least one parameter;

(c) computing means for comparing said sensor data output to at least one pre-established standard for said at least one parameter in said agricultural area, said computing means being programmed to generate said respective control signals as a result of the comparison of said sensor data output and said pre-established standard; and

(d) data transmission means connecting said sensing means and said controlled means to said computing means for receiving said sensor data output from said sensing means and transmitting said sensor data output to said computing means, and for receiving said control signals from said computing means and transmitting said control signals to said controlled means.

Re. 31,024
YARN TENSIONING DEVICE

Otto Zollinger, Spartanburg, S.C., assignor to Otto Zollinger, Inc., Spartanburg, S.C.

Original No. 3,892,371, dated Jul. 1, 1975, Ser. No. 368,735, Jun. 11, 1973. Continuation-in-part of Ser. No. 297,995, Oct. 16, 1972, Pat. No. 3,753,535. Application for reissue Oct. 19, 1978, Ser. No. 952,938

Int. Cl.³ B65H *59/22*

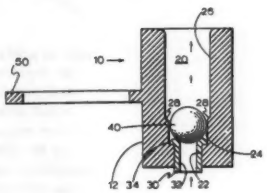
U.S. Cl. 242—152.1 **17 Claims**

1. A tension device comprising:

a. a housing, said housing having a yarn passageway extending therethrough, said yarn passageway having a small diameter section and a large diameter section;

b. an uninterrupted annular seat located in said large diameter section of said passageway at the junction of said large and small diameter sections, said seat having an annular opening passing therethrough and presenting a smooth arcuate surface extending from said opening outwardly therefrom, the curvature of said arcuate surface being in a direction opposite the curvature of a spherical element receivable thereat *said seat being defined by an insert received in said yarn passageway*; and

c. a spherical element receivable in said large diameter section of said passageway, said spherical element having a diameter less than the length of said large diameter section of said passageway and said large diameter section of said



passageway at said seat and said spherical element being comparatively sized such that said spherical element may reside at said seat out of contact with walls of said large diameter section of said passageway when no yarn is passing through said opening and such that substantial lateral movement of said spherical element is precluded whereby said spherical element continuously controls tension on a yarn passing thereby *said passageway being smooth surfaced and substantially unrestricted upwardly from said seat for a distance sufficient to permit substantially unrestricted upward movement of said spherical element during tensioning of a yarn.*

Re. 31,025
Patent Not Issued For This Number

Re. 31,026
NAVIGATION SYSTEM FOR MANEUVERING A STRUCTURE ABOUT A SUBMERGED OBJECT

Harry H. Shatto, Laguna Beach, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Original No. 4,025,895, dated May 24, 1977, Ser. No. 614,734, Sep. 18, 1975. Application for reissue May 23, 1979, Ser. No. 41,542

Int. Cl.³ G01S *15/06, 15/88*

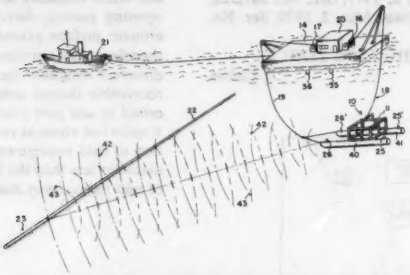
U.S. Cl. 367—106 **16 Claims**

13. A system for locating an acoustic reflecting object in a body

of water and maneuvering a water-borne structure about such object, the system comprising:

at least one pair of transducers mounted on said structure, each of said transducers of said pair being mounted on one side of said structure;

transmitter means supplying electric impulses to said transducers to cause selected ones of said transducers to transmit acoustic impulses into the body of water each of said transducers transmitting the acoustic impulses directed downwardly and inwardly;



each of said transducers detecting the resultant reflected acoustic impulses produced by its transmitted acoustic impulses and generating an electrical output in response to such detected acoustic impulses;

receiver means coupled to said transducers for selectively receiving the electrical outputs therefrom; and,

navigation means on the surface of the body of water adapted to use information received by said receiver means for piloting said structure relative to the object.

PLANT PATENTS

GRANTED SEPTEMBER 7, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,884

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 27, 1980, Ser. No. 125,139
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar *Chrysanthemum morifolium*, Ramat., plant known by the cultivar name Shamrock, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of semi-incurved capitulum form; spider capitulum type; greenish-yellow ray floret color; diameter across face of capitulum ranging from 15 to 19 cm. at maturity; uniform ten week photoperiodic flowering response to short days; very tall plant height; and semi-upright branching pattern.

4,885

ALMOND TREE

Frank E. Valenta, Delhi, Calif., assignor to Thomas Francis Valenta, Atwater, Calif., a part interest

Filed Jan. 22, 1981, Ser. No. 227,461
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by a blooming period approximately two weeks earlier than the Thompson and about two days after the Nonpareil, and by a harvest period after the Thompson and Nonpareil and approximately with the Merced.

PATENTS

GRANTED SEP. 7, 1982

ERRATA

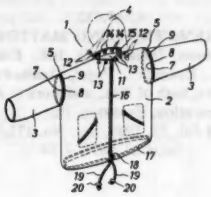
For CLASS	See PATENT NO.
441–040	4,347,635
464–032	4,347,715
464–083	4,347,716
464–064	4,347,717
528–049	4,348,307
524–110	4,348,308
523–336	4,348,309
524–167	4,348,310
524–530	4,348,311
428–144	4,348,312
524–788	4,348,313
525–439	4,348,314
549–296	4,348,322
549–362	4,348,323
549–369	4,348,324
549–419	4,348,325
549–463	4,348,326
562–538	4,348,509
526–204	4,348,515
523–425	4,348,517
378–112	4,348,590
372–074	4,348,647
372–029	4,348,648

PATENTS

GRANTED SEPTEMBER 7, 1982

GENERAL AND MECHANICAL

4,347,629
OUTERWEAR USED BOTH AS JACKET AND BAG
Toru Itoi, 861-11, Komatsuri-cho, Kishiwada-shi, Osaka, Japan
Filed Oct. 27, 1980, Ser. No. 200,966
Int. Cl.³ A41D *1/02*; A45C *3/04*
U.S. Cl. 2—108 **9 Claims**

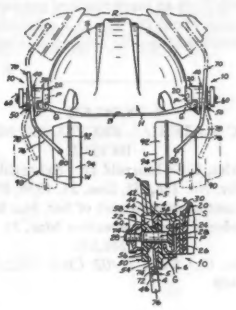


1. A convertible article useful as outerwear and a carrying bag, comprising:
- a trunk portion adapted to fit over the torso of the wearer's body;
- said portion including a back piece and side pieces forming the front of said article;
- fastening means for closing said article;
- armholes in said portion, and sleeves attached to said armholes and foldable in said trunk portion;
- means for attaching said sleeves to said armholes and for closing said armholes;
- a neck receiving opening at the upper part of said trunk portion for allowing passage of the wearer's head when said article is worn;
- means for closing said neck receiving opening; and
- a device for pulling together said back and side pieces and locking said pieces to form a bag type enclosure when said trunk portion is inverted with said neck opening closed; and
- said armholes being closed with said sleeves withdrawn into said trunk portion and said front closed.

4,347,630
FASTENER FOR HELMET JAW BAND
Hirotake Arai, and Michio Arai, both of 2-12, Azuma-cho, Oomiya-shi, Saitama-ken, Japan
Filed Dec. 20, 1979, Ser. No. 105,658
Claims priority, application Japan, May 19, 1979, 54-61773
Int. Cl.³ A42B *7/00*
U.S. Cl. 2—421 **1 Claim**

1. A fastener for coupling a helmet jaw band, said band comprising left and right jaw band sections attached to said helmet at the lower ends thereof in a frontal position, said left band having a free end loop portion and said right band having a free end flat portion, said fastener comprising a first inner ring and a second outer ring, unattached, associated with said left and right jaw band sections, each ring having upper and lower horizontal portions, said upper portion of said second outer ring having a bent L-shaped configuration which projects inwardly over said upper portion of said first inner ring such that, when said upper portions of said first and second rings are secured to said loop portion of said left jaw band, said upper portion of said first inner ring is positioned inside and below said upper bent L-shaped configuration of said second outer ring such that, upon fastenting said free end portion of said right jaw band between said lower portions of said first inner and said second outer rings, said helmet is comfortably secured when worn.

4,347,631
EAR MUFF ACCESSORY FOR SAFETY HARD HAT
William E. Newcomb, Coventry, R.I., assignor to Norton Company, Worcester, Mass.
Filed Jul. 18, 1980, Ser. No. 170,193
Int. Cl.³ A42B *1/24*
U.S. Cl. 2—423 **9 Claims**



1. A device for mounting a hearing protector on each of the opposite sides of a safety hard hat for movement in oppositely inclined planes between an operative pressure applying wearing position about ears of an individual and an inoperative pressure relieved storing position above a lower rim of and adjacent opposite sides of the hard hat comprising:
- a support having:
  - an end portion adapted for attachment to one of the opposite sides of the hard hat and a pivot stud extending axially outwardly from the end portion to an opposite outer fastener end portion thereof;
- guide means fixed against rotation about the pivot stud and having:
  - an inclined surface extending inwardly at an angle from an upper outer point to a lower inner point situated closer to a central plane between opposite sides of the hard hat and
  - a key boss projecting radially beyond opposite sides of the pivot stud and axially adjacent the inclined surface and having a width no greater than and a diameter greater than the pivot stud diameter;
- a support arm mounted about the pivot stud adjacent the guide means for relative movement in an inclined plane between operative and inoperative positions, resiliently pressing and maintaining a hearing protector in engagement with an area about the ear and having:
  - a supporting end portion at one end thereof including:
    - a central portion engageable with the guide means and extending inwardly from an outer end of an opposite inner end thereof including
  - a key hole shape slot into which extend the pivot stud and key boss adjustable relative thereto having:

an elongated slot portion of a width no less than the pivot stud diameter but less than the diameter of the key boss and an enlarged end portion adjacent the outer end of a diameter no less than the boss for receiving the boss and allowing unrestricted movement of the central portion and support arm about the boss between the operative and inoperative positions, and

at least one flexible resilient leg connected to and extending from a junction with the central portion to an opposite free end thereof adapted for attaching a hearing protector thereto at a predetermined fixed distance from the junction and resiliently pressing a hearing protector at substantially constant force into engagement with areas about the ear of an individual and

clamping means on the fastener end portion of the pivot stud for releasing and shifting the central portion and support arm to and from an extended rotatable position for movement about the key boss and sufficient guiding engagement with the inclined surface during movement between the operative and inoperative positions, and for adjusting and clamping the support arms and attached hearing protector in the operative and inoperative positions whereby the inclined surface of the guide means shifts and directs the extended support arm and attached hearing protector outwardly from an inner resilient pressure applying wearing position about the ear to a substantially pressureless stored position above the rim and adjacent side of the hard hat.

4,347,632

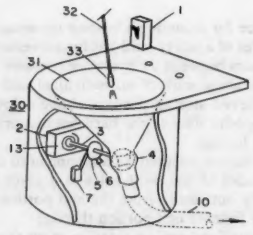
ORGANIC MATERIAL RECYCLING METHOD AND DEVICE

Jeremy F. Crins, 5308 Emerald Dr., Sykesville, Md. 21784

Division of Ser. No. 108,551, Dec. 31, 1979, Pat. No. 4,285,719, which is a continuation-in-part of Ser. No. 878,162, Feb. 15, 1978, abandoned. This application Mar. 31, 1981, Ser. No. 249,679

Int. Cl.³ A47K *11/02*; C02F *1/02, 11/08*

U.S. Cl. 4—449 **11 Claims**



1. A human liquid and solid excrement handling system, comprising:

(a) a holding tank, a toilet having a bowl portion and valve means terminating in an orifice means;

(b) conduit means connected between said orifice means and said holding tank providing a first inlet thereto, said valve means operating to open and sealingly close said bowl portion;

(c) means for applying partial vacuum to said holding tank, conduit means, and valve means, at least when said valve means opens said bowl portion;

(d) separate fluid pressure means to apply fluid, under pressure, to the inner surface of said bowl portion;

(e) means for selectively actuating said valve means whereby congolmerated waste material responsive to said partial vacuum passes sequentially from said bowl portion through said valve means and through said conduit means and enters said holding tank;

(f) a pressure differential resistive grille located substantially horizontally within said holding tank, said grille dividing said holding tank into two zones, an upper zone and a lower zone;

(g) means for providing heat and moisture within said holding tank by natural circulation;

(h) separate access means adjacent to the top side of said grille for removal of a portion of the material collected on said grille; and,

(c) collecting means whereby the liquid drainage can be removed from below said grille.

4,347,633

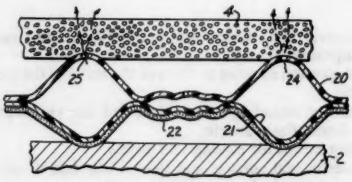
PATIENT TREATING MATTRESS

Clifford E. Gammons, Indianapolis, Ind.; Francis C. Moore, Cape Coral, Fla.; Kenneth L. Pagel, Manitowoc, and Barry N. Jackson, De Pere, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 22, 1980, Ser. No. 171,051

Int. Cl.³ A61G *7/04*

U.S. Cl. 5—453 **25 Claims**



1. A "crawl resistant" flexible mattress comprising: a bottom panel; a top panel sealed to the bottom panel to define at least two alternatingly inflatable structures on the mattress, and a continuous crawl resistant layer bonded to a substantial portion of the outer surface of at least one of the panels to follow the contour of the alternatingly inflatable structures on the mattress to reduce crawl of the mattress during use.

4,347,634

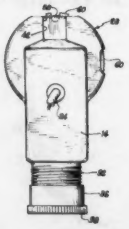
PRECISION PIPE CUTTER AND REAMER COMBINATION

Anis S. Sawan, 1025 S. Magnolia, El Cajon, Calif. 92020

Filed Aug. 14, 1980, Ser. No. 177,904

Int. Cl.³ B25F *3/00*; B23D *21/06*

U.S. Cl. 7—157 **8 Claims**



1. A hand-held pipe cutter comprising:

(a) a housing adapted to be hand held;

(b) a depth limiter plate mounted in said housing and having an edge defining a plurality of guide notches of graduated sizes;

(c) said housing having an opening sufficiently large and suitably positioned when aligned to expose at least one of said notches at a time, including the largest notch, and said

housing and plate being mutually movable to selectably expose different ones of said notches through said openings; and

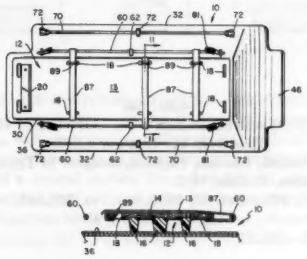
(d) a powered cutting blade passing adjacent said plate and over at least a portion of a notch exposed by said opening to cut an object guided therein.

4,347,635

STRETCHER AND LITTER COMBINATION

Leigh E. Eisenhauer, Van Wert, Ohio, assignor to The Eisenhauer Manufacturing Company, Van Wert, Ohio

Filed Jan. 30, 1980, Ser. No. 116,831
Int. Cl.³ B63C *9/04*
U.S. Cl. 441—40 **7 Claims**



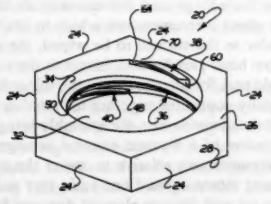
1. In combination, a rescue litter and stretcher, said stretcher having an elongated body section adapted to support a person in reclined position thereon, said litter being floatable and having an elongated body section adapted to receive and support said stretcher, and means for releasably securing said stretcher upon the body section of said litter, said securing means including rails on said litter along opposite sides of said stretcher, and a plurality of transverse straps a first of which releasably secures said stretcher to one of said rails and a second of which releasably secures said stretcher to the other of said rails, said stretcher having a plurality of hand holes in said body section spaced from one another along each side thereof with the holes along one side of said body section being respectively laterally opposed to the holes along the opposite side thereof to provide pairs of laterally opposed holes, said first strap extending through one pair of laterally opposed holes and looped over said one of said rails and said second strap extending through another pair of laterally opposed holes and looped over said other rail.

4,347,636

NUT AND METHOD OF FORMING THE SAME

Terry D. Capuano, Hinckley, Ohio, assignor to Lamson & Sessions Co., Cleveland, Ohio

Filed Nov. 7, 1979, Ser. No. 92,228
Int. Cl.³ B21D *53/24*
U.S. Cl. 10—86 F **32 Claims**



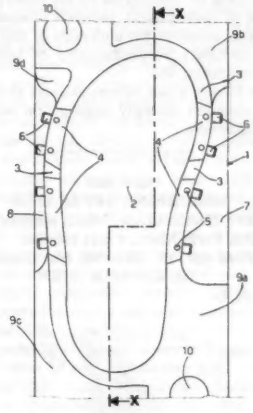
1. A method of forming a nut having a plurality of thread convolutions, said method comprising the steps of providing a metal blank, forming an inner thread convolution in a central portion of the blank, said step of forming the inner thread convolution including the step of cold working the metal of the blank with a first punch, said step of forming an inner thread convolution further including the step of forming an opening in the blank in which the inner thread convolution is formed, and forming an outer thread convolution in a portion of the blank which is axially outwardly of the inner thread convolution, said step of forming an outer thread convolution including the step of cold working the metal of the blank with a second punch after performing said step of cold working the metal of the blank with a first punch, said step of forming an outer thread convolution further including the steps of forming a projection which extends outwardly from a side surface of the blank during said step of forming an inner thread convolution and moving the metal in the projection into the opening in the blank after forming the inner thread convolution.

4,347,637

MANUFACTURING PROCESS OF SANDALS AND CLOGS WITH PLASTIC SOLES AND SHOES MANUFACTURED THROUGH THIS PROCESS

Francesco Ardito, Barletta, Italy, assignor to Calzaturificio "Plastica Excelsior" di Francesco Ardito, Barletta, Italy

Filed May 9, 1980, Ser. No. 148,495
Claims priority, application Italy, May 11, 1979, 2119 A/79
Int. Cl.³ A43D *9/00*; A43B *3/12*
U.S. Cl. 12—142 S **4 Claims**



1. A manufacturing process for footwear containing plastic soles comprising:

providing at least two straps each having means for attachment on one end and some first holes of wide rectangular, circular or other suitable section inboard of and adjacent to the opposite end;

providing a first sole mold portion having flutings on the side edges forming oppositely disposed side openings and a plurality of vertical stakes projecting upwardly from the flutings of said first sole mole portion;

inserting ends of said straps in said oppositely disposed side flutings of the first sole mold portion, inserting the vertical stakes in some second holes of the straps smaller then the first holes in connection with the vertical stakes;

attaching a second sole mold portion adjacent the first mold portion without openings for the end portions of the straps therebetween, wherein said molds have receiving means for the vertical stakes; and

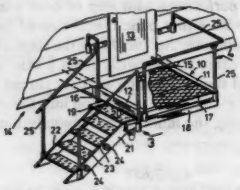
pouring a fluid plastic mix suitable to expand itself into said sole mold portions to fill the whole inner volume of the mould itself.

4,347,638

RETRACTABLE PORCH AND STAIR APPARATUS FOR TRAILERS

Murland L. Weaver, 748 N. 900 West, Apt. 104, Salt Lake City, Utah 84116

Filed Mar. 10, 1980, Ser. No. 128,380
Int. Cl.³ E01D 1/00
U.S. Cl. 14—71.1 6 Claims



1. A combination retractable porch and stair apparatus for trailers, comprising in combination;

floor means mounted on a pair of elongate spaced-apart channel iron support members;

a second pair of cooperating elongate, spaced-apart channel iron support members slidingly receiving said first pair of support members, said second pair of support members being adapted for attachment on the underside of a trailer;

a third pair of spaced-apart, elongate channel iron support members mounted on the underside of said second pair of support members perpendicularly of said first pair of support members; and

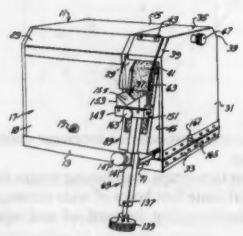
stair means having a pair of spaced-apart elongate stair side support members slidingly mounted on said third pair of support members.

4,347,639

DEBURRING APPARATUS

Walter Le Tarte, Smiths Creek, Mich., assignor to Richard A. Anthony, Oak Park, Mich., a part interest

Filed Apr. 13, 1981, Ser. No. 253,604
Int. Cl.³ A46B 13/02
U.S. Cl. 15—21 D 17 Claims



1. In a deburring apparatus having a housing with front and rear walls, a base and a deburring wheel rotatably mounted within said housing on said base upon a longitudinal axis, with the wheel partly projecting through said front wall;

a workpiece holder assembly forwardly of said front wall for holding a workpiece in registry with said wheel;

a guide on said base extending rearwardly of said front wall;

an elongated tube overlying said base movably mounted upon said guide;

an elongated screw nested within and projecting from one end of said tube, at one end journalled upon said base, retained against longitudinal movement and projecting through and outwardly of said rear wall;

a feed tube having a threaded bore nested within the other end of said elongated tube, at one end threadably receiving said screw and at its other end pivotally connected to the other end of said elongated tube;

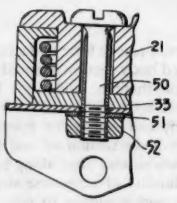
whereby selective manual rotation of said screw adjustably feeds said elongated tube and connected workpiece holder assembly inwardly and outwardly of said housing relative to said deburring wheel.

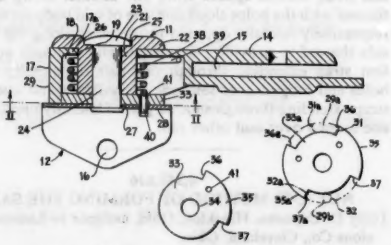
4,347,640

CONNECTOR ASSEMBLIES FOR CONNECTING WIPER BLADES TO WIPER ARMS

Graham Durtnal, London, England, assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Oct. 30, 1980, Ser. No. 202,249
Int. Cl.³ B60S 1/40
U.S. Cl. 15—250.32 8 Claims





1. A connector assembly for use in connecting a wiper arm and a wiper blade for pivotal movement of the blade in relation to the arm about a common axis which in use is substantially perpendicular to the surface to be wiped, the assembly comprising a first basic part for attachment to the wiper arm and a second basic part for attachment to the wiper blade, the parts being pivotally connected together for relative angular movement about the common axis, the assembly being characterized by the inclusion of a discrete element arranged for rotation about the common axis relative to one of the two basic parts, first abutment means on said one basic part and second abutment means on said discrete element disposed for engagement with said first abutment means to limit the range of angular movement of said basic parts relative to each other and normally loaded spring means for biasing said first and second abutment means into engagement with each other.

4,347,641

WIPER ARM

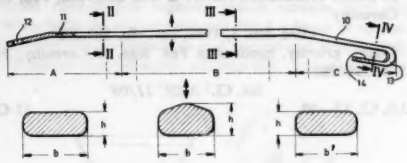
Alfred Kohler, and Hans Prohaska, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 19, 1980, Ser. No. 151,297

Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2919867

Int. Cl.³ B60S 1/34

U.S. Cl. 15—250.35 1 Claim



1. A wiper arm comprising a wiper rod formed from a single, solid rod of approximately circular cross section, said wiper arm having first and second end sections, each of said end sections being formed to an approximately rectangular cross-section, and a central section formed to have a cross-section approximately that of a rectangular having a triangle on top, said central section being smaller in width but greater in height than said rectangular cross-section.

4,347,642

WIPER ARM

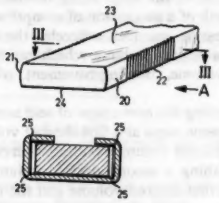
Kurt Bauer, Ingersheim, and Christian Roth, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 11, 1981, Ser. No. 233,661

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006188

Int. Cl.³ B60S 1/34

U.S. Cl. 15—250.35 8 Claims



1. A wiper assembly comprising:

a wiper rod having a substantially rectangular cross-section and formed of relatively hard material;

a link formed of relatively soft material, said link having a substantially U-shaped cross section comprising a web and two side walls;

a fastening member; and

a spring element attached between said fastening member and said wiper rod to provide contact pressure;

said wiper rod having engraved toothing on a first lateral surface and having sharp edged projections on one front surface adjacent said lateral surface, said projections and said toothing being adapted to dig on bite into said link whereby when said link and said wiper rod are assembled, said projections and said toothing are embedded into said link such that said link and said wiper rod are lockingly engaged.

4,347,643

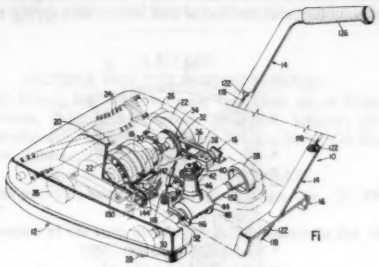
POWER ASSIST DRIVE UPRIGHT VACUUM CLEANER AND POWER ASSIST DRIVE SYSTEM THEREFOR

Scott S. Bair, III, Atlanta, Ga., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 23, 1981, Ser. No. 228,021

Int. Cl.³ A47L 9/00

U.S. Cl. 15—340 8 Claims



1. In an upright suction cleaner for floor coverings and the like having a chassis, an elongated handle pivotally mounted thereon, a drive motor and a pair of drive wheels mounted with said chassis for rotation with a common drive shaft, and a transmission for receiving rotary power from said drive motor and selectively applying rotary power to said common drive shaft, said transmission comprising a transmission housing through which said drive shaft extends generally horizontally and an input shaft extends generally perpendicular to said drive shaft, a spur gear mounted on said perpendicular input shaft in constant mesh with a pair of opposed face gears rotatably carried about said drive shaft for rotation in opposite rotational directions, a clutch operatively associated with each of said face gears on the outside surfaces thereof, a clutch operating lever free floating about said drive shaft outboard of each of said clutches, said operating levers each being provided with a plurality of ramp surfaces extending annularly about said drive shaft, means for cooperating with said ramp surfaces on said operating levers to initiate selective engagement of said clutches, an operating fork associated with both said operating levers so that movement of said fork in one direction will initiate cooperation between said ramp surfaces on one of said operating levers and said cooperating means to influence an axial shift of one of said clutches into engagement to drive said cleaner in a forward direction by one of said face gears and movement of said fork in the other direction will influence an axial shift of the other of said clutches to propel said cleaner in a reverse direction by the other of said face gears, and control means for connecting said fork to a hand grip on the cleaner handle whereby forward movement of said hand grip drives said cleaner forwardly and rearward movement of said hand grip drives said cleaner rearwardly.

4,347,644

OVER-CENTER SELF CLOSING HINGE

Karl Lautenschläger, Reinheim, and Gerhard W. Lautenschläger, Brensbach-Wersau, both of Fed. Rep. of Germany, assignors to Karl Lautenschläger KG Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,557

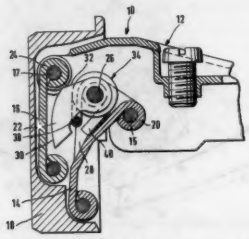
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951986

Int. Cl.³ E05D 11/10

U.S. Cl. 16—50 5 Claims

1. An over-center hinge for a cabinet door, said hinge having a supporting-wall related part in the form of a supporting arm, and a door-related part in the form of a cup adapted to be mounted in a recess in the door, a first link and a second link, each having first ends pivotingly mounted in said cup and second ends with pivot eyes pivoted on said supporting-wall-

related part so as to form a four-pivot linkage, a roller rotatably mounted in said supporting arm, a pressure piece biased by a spring and pivotingly mounted in said supporting arm at said second link and bearing against a counter-surface which during the hinge movement undergoes a change of position relative to the pressure piece such that the hinge, after passing beyond a dead center during the closing movement, is resiliently forced into the closed position, said counter-surface being formed by the circumferential surface of said roller, said spring being a



torsion spring with coils and two arms ending in free ends, one arm bearing against said second link and the other arm bearing against said pressure piece, a pin holding said spring, said pin being provided at a distance above said pivot eye of said second link and passing through said coils of said torsion spring, and having two ends respectively held in ears formed on and bent up from opposite longitudinal sides of said second link, the configuration being such that said free ends point out of the supporting arm toward the door-related part.

4,347,645

SELF CLOSING HINGE

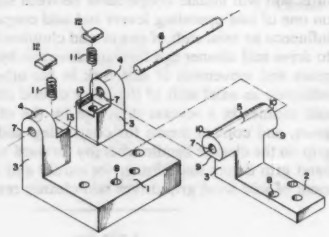
Kazuo Iseki, Tokyo, Japan, assignor to Ohta Company Limited, Tokyo, Japan

Claims priority, application Japan, Aug. 18, 1979, 52-113966[u]; May 6, 1980, 55-61637[u]

Filed Aug. 15, 1980, Ser. No. 178,427

Int. Cl.³ E05F *1/12*

U.S. Cl. 16—291 **4 Claims**



1. A hinge comprising:

an L-shaped stationary flap having a pair of legs each formed with a recess;

an L-shaped rotatable flap having a leg disposed between said legs of said stationary flap and defining a pair of oppositely directed cam shafts projecting from the opposite ends, respectively, of said leg of said rotatable flap;

each of said legs having a rounded, tubular end formed with an axial hole which also extends through said cam shafts which are received in said recesses;

a hinge pin extending through said axial hole;

each of said cam shafts having a flat surface;

a cam rest provided in each said recess and contacting said flat surface of one of said cam shafts; and

a spring provided in each said recess for urging one of said cam rests outwardly to maintain said one cam rest in intimate contact with each said cam shaft.

4,347,646

METHOD AND APPARATUS FOR SEQUENTIAL PORTIONING OF A PLASTICALLY DEFORMABLE MASS, IN PARTICULAR SAUSAGE STUFFING

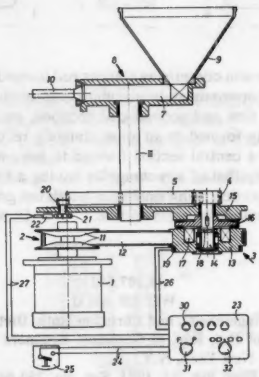
Georg Staudenrausch, Biberach, Fed. Rep. of Germany, assignor to Albert Handtmann GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Jan. 4, 1980, Ser. No. 109,205

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900585

Int. Cl.³ A22C *11/08*

U.S. Cl. 17—49 **11 Claims**



1. In a method of portioning a deformable flowable mass, especially sausage stuffing, which comprises displacing and compressing the mass in successive steps along a flow path with a portion of the mass being discharged from said flow path with each of a succession of compression steps by a movable compression member whereby the discharged portion amounts to a desired volume which can be augmented by an overshoot volume, the improvement which comprises the steps of:

(a) terminating the movement of said member for one of said compression steps at a first desired volume and measuring the overshoot volume resulting therefrom;

(b) establishing a second desired volume as the difference between the first desired volume and the measured overshoot volume;

(c) terminating the movement of said member for the next compression step at said second desired volume; and

(d) repeating steps (a) through (c) for the successive compression steps following said next step.

4,347,647

APPARATUS FOR MAKING NO-TWIST YARN

Roger S. Brown, Clemson, S.C.; Harold L. Salaun, Jr., and Gain L. Louis, both of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 30, 1980, Ser. No. 202,397

Int. Cl.³ D01G *19/10*

U.S. Cl. 19—128 **10 Claims**

1. Fiber drafting and parallelizing apparatus comprising:

a. a first roll having fiber-combing teeth on its surface,

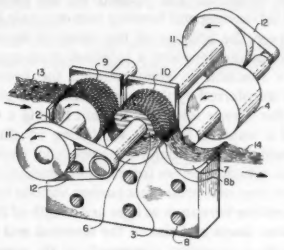
b. a second roll having fiber-combing teeth on its surface, said second roll being parallel and adjacent to said first roll to define a pocket therebetween;

c. a third roll having a resilient surface, said third roll being

parallel and adjacent to said second roll to define a pocket therebetween;

d. means to rotate said first, second and third rolls in the same direction at sequentially greater surface speeds;

e. a curved surface conforming to the surfaces of said first, second and third rolls, said curved surface including a first apex-shaped segment which extends into said pocket between said first and second rolls so as to conform said curved surface to said first and second rolls in said pocket therebetween; said curved surface further including a second apex-shaped segment which extends into said pocket between said second and third rolls so as to conform said curved surface to said second and third rolls in said pocket therebetween; wherein said curved surface is



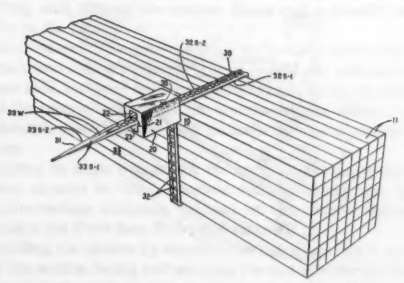
closely adjacent but does not touch said first and second rolls; wherein said curved surface touches said third roll at said second apex-shaped segment; and wherein said fiber-combing teeth of said first roll carry fibers between said first roll and said closely adjacent curved surface to said first apex-shaped segment, afterwhich said fibers are picked up by said fiber-combing teeth on said second roll and carried between said second roll and said closely adjacent curved surface to said second apex-shaped segment, afterwhich said third roll, in combination with said second apex-shaped segment, grips said fibers and removes said fibers from said second roll to carry said fibers between said third roll and said closely adjacent curved surface, so that said fibers emerge from said third roll in a parallelized and drafted condition.

4,347,648

LADDER STRAP HARNESSING DEVICE WITH WEBBED TAIL

Leo P. Dekkers, Scituate Harbor, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed May 12, 1980, Ser. No. 149,210
Int. Cl.³ B65D *63/00*; F16B *2/08*
U.S. Cl. 24—16 PB **8 Claims**



1. A harnessing device comprising

a head having an elongated guide channel extending therethrough,

a locking tang within said head, and

a strap formed by a structure with members which are sequentially engaged by the locking tang when the strap is inserted into the channel,

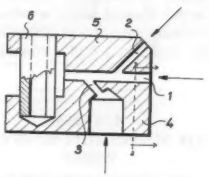
said strap having a webbed tail portion flanked by side rails which extend from said members continuously surrounding said webbed portion and forming an angle with said strap.

4,347,649

NOZZLE FOR TEXTURING THREAD

Miloslav Pavek; Miroslav Novacek; Jiri Fantl, all of Liberec; Jan Kara, Prague, and Zdenek Kasparek, Liberec, all of Czechoslovakia, assignors to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jun. 27, 1980, Ser. No. 163,425
Claims priority, application Czechoslovakia, Jun. 27, 1979, 4420-79
The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.
Int. Cl.³ D02G *1/16*
U.S. Cl. 28—254 **4 Claims**



1. A nozzle for combining two threads and texturing the resultant composite thread by a gaseous fluid flow, comprising a nozzle body, a nozzle lid mounted on the nozzle body, a first angular channel for guiding a first thread, a second channel for guiding a second thread opening obliquely into the first channel, a third channel for feeding gaseous fluid opening obliquely into and intersecting the first channel downstream of the intersection of the first and second channels, a texturing bridge located at the exit of the first channel formed by a hollow tube having an axis skewed relative to the longitudinal axis of the first channel, the tube having an open end and a side wall which is provided with a longitudinal wedge-shaped opening, disposed opposite the exit opening of the first channel, the longitudinal opening extending through the side wall of the tube to the hollow interior thereof being directed angularly toward and intersecting the longitudinal axis of the first channel, whereby a first thread is fed into the first channel, a second thread is fed through the second channel into the first channel where it combines with the first thread and the composite thread is met by the gaseous fluid from the third channel and projected against the texturing bridge and the resulting composite textured thread is then withdrawn through the opened end of the texturing bridge.

4,347,650

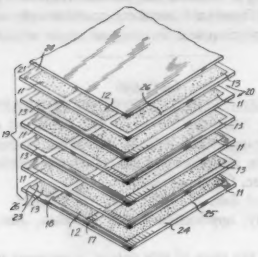
METHOD OF MAKING MARGINLESS MULTI-LAYER CERAMIC CAPACITORS

Joseph C. Mc Larney, Portville, and David J. Lightweis, Olean, both of N.Y., assignors to AVX Corporation, Myrtle Beach, S.C.

Filed Sep. 22, 1980, Ser. No. 189,023
Int. Cl.³ H01G *4/12*
U.S. Cl. 29—25.42 **6 Claims**

1. The method of making a marginless multi-layer ceramic capacitor comprising the steps of forming a plurality of sheets of green ceramic, depositing on each of said sheets an electrode

pattern comprising at least one elongate, rectangular, continuous strip of electrode material, the length of said strip being a major multiple of the projected electrode width of a finished capacitor, superimposing a plurality of said electrode bearing sheets to form a stack having alternate parallel layers of electrode and ceramic, such that the longitudinal edges of the



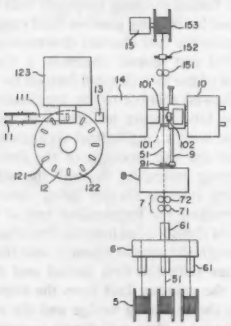
electrode strips of alternate sheets are in alignment and the longitudinal edges of the electrode strips of adjacent sheets are in staggered relation, severing increments of said stack transversely of the length thereof along severance lines, each said severance line defining the borders of two adjacent marginless capacitor blanks, and firing and terminating said capacitor blanks.

4,347,651

SYSTEM FOR MANUFACTURING CONNECTION WIRES

Takayuki Inoue, and Tatsuya Iwasa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,242
Claims priority, application Japan, Jul. 18, 1979, 54-92440
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—33 M **1 Claim**



1. A system for manufacturing connection wires with different shapes and sizes comprising:

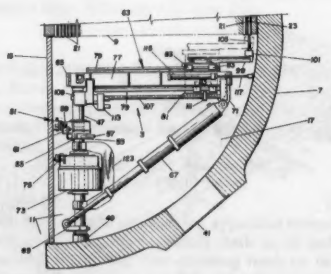
a wire selection and supply unit having a function to hold various types of wires at the terminal and to select necessary wires to manufacture, a tension mechanism to supply wires selected, and a function to feed the selected wire; a wire-length measuring and wire supply unit having a function to feed specified wires in forward and reverse directions, and a function to measure the length of the wire; a marking unit having a function to select characters and signs, which are specified, as wire connection information and marks them on both end portions of each wire; a wire fixed-length and pulling unit having a function to hold and feed the wire by a fixed length; a wire cutting and stripping unit having a function to cut the wire at specified positions and to strip an insulating cover at both end portions by a specified length for press-connecting with the wire; a press-connecting terminal fabricating and forming unit with two or more sets of terminal fabricating and forming jigs for supply press-connecting terminals with specified shapes and specified sizes to the end portions of the wires, which press-connecting terminal fabricating and forming unit has a function to select the jig from those ones in accordance with a direction and to continuously form pairs of the press-connecting terminals with specified shapes and sizes, each being coupled at the heads with each other by a separating portion, in a hoop material as the terminal material; a unit for holding the hoop terminal material to supply the hoop material to the press-connecting terminal fabricating and forming unit; a terminal supply unit having a function to cut the press-connecting terminals fabricated and formed by the press-connecting terminal fabricating and forming unit on a pair-by-pair basis, and to keep the holding of the terminal for transfer to a press-connecting location; a terminal press-connecting unit having a function to press-connect the press-connecting terminal transferred by the supply unit to the given terminal ends of the wire; a wire take-up unit having a tension function and a traverse function for taking up the connection wire manufactured through the respective units by a drum; and a unit which receives from an information medium such as a paper tape or a preset mechanism various information of the connection wire such as type and length of the wire, wire connection, shape and size of the terminal and the like, and issues various operation commands to the respective units; whereby upon application of the operation command to the respective automatic units, a specified wire is taken out and set in said respective units, the wire is marked with connecting information and the like, the wire is cut into a given length of the wire, insulating cover at the terminal ends of the wire is stripped, the pair of the press-connecting terminals with specified shapes and sizes, being coupled at the heads with each other by the separating portion, are press-connected to the connection wire with the terminal ends processed in the insulating cover stripping, thereby to connect the connection wires, and the wires once cut by the given length are again connected by the terminal portions thereby to be wound around the drum while those are coupled with one another, whereby the connection wires are connected in a continuous manner.

4,347,652

METHOD FOR SERVICING A STEAM GENERATOR

Frank W. Cooper, Jr., and Raymond P. Gastner, both of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 952,431, Oct. 18, 1978, abandoned. This application Jul. 1, 1980, Ser. No. 164,859
Int. Cl.³ B23Q *17/00*
U.S. Cl. 29—407 **4 Claims**



1. A method of verifying the alignment of an elongated tool

arm pivotally mounted for rotation about one end thereof by an electrically controlled servomechanism in a plane parallel to the surface of a substantially semicircular tubesheet of a stream generator, with the pivot point of the arm located near the center of the straight side of the semicircular tubesheet, said method comprising the steps of:

generating a control signal to rotate the arm to first, second and third angular positions in the plane substantially parallel to the surface of the tubesheet;

generating electrical signals representative of the distance from a preset point along the control arm to the tubesheet at each of said three angular positions;

comparing said electrical signals;

adjusting the angle that the pivotal axis of the arm makes with the tubesheet when said first, second and third electrical signals are not within a predetermined tolerance of each other; and

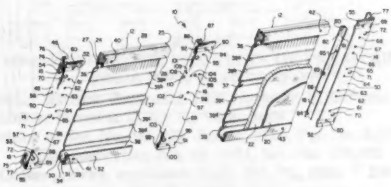
repeating the above steps until said electrical signals are within said predetermined tolerance of each other.

4,347,653

METHOD OF PREPARING A SECTION FOR AN OVERHEAD DOOR

David O. Martin, Salt Lake City, and Lawrence G. Martin, Bountiful, both of Utah, assignors to Martin Overhead Door and Electronics Company, Salt Lake City, Utah

Division of Ser. No. 59,880, Jul. 23, 1979, Pat. No. 4,284,119.
This application Mar. 23, 1981, Ser. No. 246,805
Int. Cl.[3] B23P *19/00*
U.S. Cl. 29—526 R 5 Claims



1. A method of preparing a section for an overhead door system comprising:

forming a section facing for the section by shaping a generally rectangular sheet of metal with a longitudinal channel along each edge of the section facing and a plurality of ribs in the facing;

fabricating end stiles for the section by forming sheet metal stock into end stiles having a front face, a side wall and a rear face, the front face being adapted to overlap the end of the section facing with the rear face fitting within the channels while the side wall encloses the end of the section;

preparing an angle support for the end stile, the angle support adapted to being received inside the end stile to accommodate clamping the end of the section facing against the front face of the end stile; and

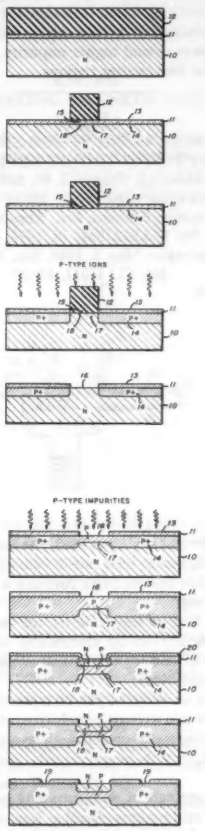
assembling the section by mounting an end stile to each end of the section facing and securing the end stile thereto by securing the angle support to the ribs of the section facing and to the side wall of the end stile.

4,347,654

METHOD OF FABRICATING A HIGH-FREQUENCY BIPOLAR TRANSISTOR STRUCTURE UTILIZING PERMEATION-ETCHING

Bert L. Allen, Cupertino; Robert L. Wourms, Santa Clara, and Daniel C. Hu, Saratoga, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 18, 1980, Ser. No. 160,513
Int. Cl.[3] H01L *21/306, 21/265*
U.S. Cl. 29—576 B 9 Claims



1. A method of fabricating a bipolar structure having emitter, higher impurity concentration base and lower impurity concentration base regions comprising the steps of:

forming a first masking layer of silicon dioxide on the surface of a semiconductor substrate of a first conductivity type;

forming a second masking layer of negative photoresist over said first masking layer;

forming openings in said second masking layer exposing regions of said first masking layer which lie over those regions of said semiconductor substrate where said higher impurity concentration base regions are to be located:

removing said first masking layer material located between the remaining portions of said second masking layer and said semiconductor substrate, using permeation-etching wherein said remaining portions define the area of said removal of said first making layer;

forming said higher impurity concentration base regions by introducing impurities of a second conductivity type through said first masking layer into said semiconductor substrate to a first depth, using said remaining portions of

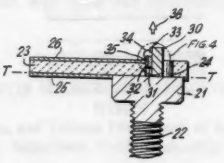
said second masking layer to define the location of said higher impurity concentration base regions;
removing said remaining portions of said second masking layer material thereby exposing areas of said semiconductor substrate;
forming said lower impurity concentration base regions by introducing impurities of said second conductivity type into said exposed areas of said semiconductor substrate to a second depth;
forming said emitter regions by introducing impurities of said first conductivity type into said exposed areas of said semiconductor substrate to a third depth; and
providing contacts to said higher impurity concentration base regions and to said emitter regions.

4,347,655

MOUNTING ARRANGEMENT FOR SEMICONDUCTOR OPTOELECTRONIC DEVICES

Peter S. Zory, Ossining; Frederick W. Scholl, Riverdale, and Harry F. Lockwood, New York, all of N.Y., assignors to Optical Information Systems, Inc., Elmsford, N.Y.

Division of Ser. No. 946,592, Sep. 28, 1978, Pat. No. 4,240,098. This application May 5, 1980, Ser. No. 147,047
Int. Cl.³ H01L *33/00*
U.S. Cl. 29—589 **12 Claims**



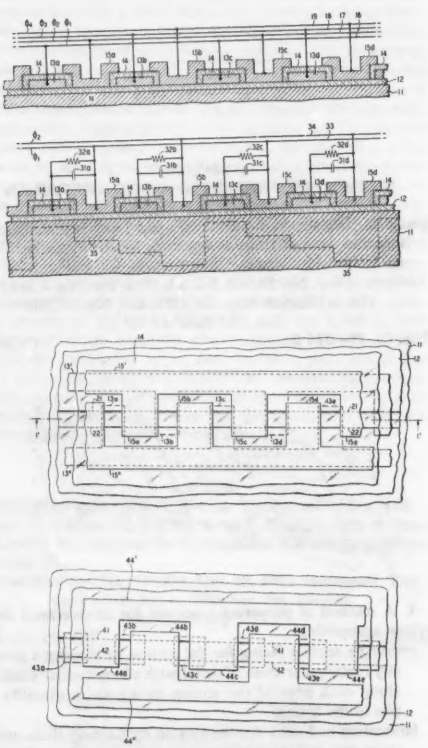
1. A process for packaging at least one semiconductor optoelectronic device, said at least one device comprising adjacent regions of opposite conductivity forming a p-n junction, said process comprising:
(a) mounting said at least one device on a block of high thermal conductivity by electrically and thermally connecting one of said regions of said at least one device to a portion of said block;
(b) configuring an isolation pad on a portion of said block in proximity to said at least one device, at least a portion of which isolation pad is coated with an electrically conducting coating, which is electrically insulated from said block;
(c) attaching one end of an electrically conducting lead to the other of said regions of said at least one device and the other end of said lead to said electrically conducting coating on said isolation pad;
(d) mounting said block on a device mount comprising:
(1) a metallic stud comprising pedestal and screw portions of high thermal conductivity and
(2) an elongated insulator tab, a portion of the bottom of which is mounted on top of said pedestal portion of said stud, said insulator tab being provided with (a) an opening therethrough at the mounted end, (b) an electrically conducting layer along the bottom of said insulator tab making electrical contact to said stud and (3) at least one electrically conducting layer along the top of said insulator tab, terminating at said opening,
said block electrically attached to the top surface of said pedestal of said stud through said openings, said block configured so that said isolation pad is in juxtaposition with at least one electrically conducting layer on top of said insulator tab; and
(e) forming an electrical connection between said electrically conducting coating on said isolation pad and said at least one electrically conducting layer on top of said insulator tab.

4,347,656

METHOD OF FABRICATING POLYSILICON ELECTRODES

George E. Smith, Murray Hill, and Robert J. Strain, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 10,731, Feb. 9, 1979, abandoned, which is a continuation of Ser. No. 885,385, Mar. 10, 1978, abandoned, which is a continuation of Ser. No. 592,368, Jul. 2, 1975, abandoned, which is a continuation of Ser. No. 458,507, Apr. 8, 1974, Pat. No. 3,921,195, which is a continuation of Ser. No. 85,026, Oct. 29, 1970, abandoned. This application Dec. 22, 1980, Ser. No. 218,952
Int. Cl.³ H01L *21/285, 21/308*
U.S. Cl. 29—591 **1 Claim**



1. A method for making an electrical circuit comprising a silicon semiconductor device having a silicon substrate, an insulating material having a maximum thickness of approximately 1000 Angstroms covering a portion of the substrate, and at least one pair of separate closely spaced electrodes on the insulating material, a first electrode of the pair formed by a first metallization step, and a second electrode of the pair formed by a second metallization step so as to partially overlap the first electrode of the pair, the pair of electrodes defining a channel region in the silicon semiconductor substrate directly underlying said pair of electrodes, the said channel region

being of a single conductivity type the method comprising the steps of

(a) forming a first insulating layer on a silicon substrate, said layer comprising a thin portion, and a relatively thick portion surrounding the thin portion, the thin portion having a maximum thickness of approximately 1000 Angstroms,

(b) depositing a first conductive layer comprising silicon on the first insulating layer,

(c) shaping by a lithographic process the silicon layer into a geometry including at least one silicon electrode as the first metallization step to produce the first electrode of the pair of closely spaced electrodes, the electrode being formed on the thin portion of the first insulating layer overlying a first part of said channel region of the silicon substrate, and completely physically spaced from said channel region,

(d) forming a second silicon dioxide layer over the exposed surfacce of the silicon electrode, said layer being formed in situ by oxidizing the silicon electrode to form a silicon dioxide layer by chemical conversion of the silicon electrode,

(e) depositing a second conductive layer overlying at least the entire channel region,

(f) shaping by a lithographic process the second conductive layer into a geometry including at least one second electrode as the second metallization step to produce the second of the pair of closely spaced electrodes, the second electrode being formed overlying the remaining part of said channel region of the silicon substrate and covering at least part of the second silicon dioxide layer but completely separate from the first electrode and the substrate throughout said channel region,

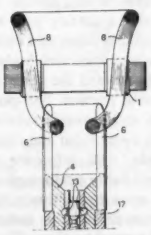
said second electrode thereby being formed overlying at least part of the first electrode so that the first electrode overlying the first part of said channel region and the part of the second electrode overlying the remaining part of said channel region are separated side by side only by the second silicon dioxide layer, and both electrodes are separated from the channel region,

and electrically connecting said first and second electrodes of the semiconductor device into an electrical circuit.

4,347,657
METHOD FOR THE INSERTION OF PRE-WOUND COILS INTO STATOR SLOTS

Giorgio Barrera, Leumann, Italy, assignor to Officine Meccaniche Pavesi & C. S.p.A., Turin, Italy

Division of Ser. No. 169,339, Jul. 16, 1980, Pat. No. 4,291,459. This application Jun. 19, 1981, Ser. No. 275,400
Claims priority, application Italy, Feb. 11, 1980, 67200 A/80
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—596 **1 Claim**



1. A method for the insertion of pre-wound coils into stator slots of a stator of a rotary electric machine using a cylindrical finger holder having on its periphery a series of longitudinal grooves and an annular series of fingers fixed in said grooves of said finger holder and extending beyond one end of the said finger holder to receive said pre-wound coils, said method comprising the steps of:

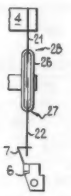
inserting into a stator an end portion of said cylindrical finger holder opposite said one end thereof from which said fingers project;

angularly orienting said finger holder in order to align pre-wound coils carried by said fingers thereof with said stator slots, and effecting an axial displacement of said finger holder through said stator with said end portion as the leading end thereof, whereby to cause said fingers to draw said pre-wound coils carried thereon through said stator and to insert them into the slots of said stator.

4,347,658
METHOD OF MAKING MAGNETIC REED CONTACT UNIT

Brian E. Head, Bexley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,822
Claims priority, application United Kingdom, Jul. 31, 1979, 7926703
Int. Cl.³ H01H *11/00*
U.S. Cl. 29—602 R **7 Claims**

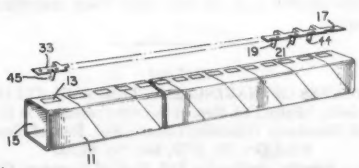


1. A method of making a sealed magnetic reed contact unit comprising holding a first reed, supporting a second reed from the first by magnetic attraction between overlapped adjacent ends of the reeds and aligning the second reed with the first reed by moving the remote end of the second reed in the plane of the overlapped ends by locating the remote end in a forked guide member, any nearby magnetic influence on the remote end of the second reed being minimized if not eliminated, and sealing the reeds through the wall of an enclosure member.

4,347,659
METHOD OF MAKING STICK WOUND COILS

Richard L. Dalton, Jr., West Bend, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 17, 1980, Ser. No. 131,258
Int. Cl.³ H01F *41/10*
U.S. Cl. 29—605 **14 Claims**



1. The method of concurrently forming a plurality of coils of wire comprising the steps of:

providing an elongated hollow coil form of insulating material having an opening extending therethrough in the direction of elongation, the coil form arranged to have a plurality of holes along one surface in the direction of elongation, each hole communicating with the hollow opening;

disposing a first conductive strip along a substantial portion of the coil form in the direction of elongation by passing a like plurality of conductive tab portions of the first conductive strip through respective holes and into the coil form opening;

connecting a plurality of first wire ends from a like plurality of wire sources in the first conductive strip;

simultaneously winding a like plurality of coils, one from each source, about the coil form;

disposing a second conductive strip in the direction of elongation along an outer surface of each of the wound coils;

connecting second wire ends of each of the plurality of coils to the second conductive strip; and

severing individual coils from other of the coils for subsequent use.

4,347,660

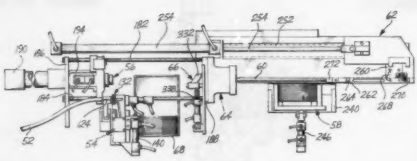
QUICK CHANGE DRILL ASSEMBLY MACHINE

Michael R. Cannon, Redmond; Robert L. Fuller, Jr., Issaquah, and Dwayne E. Proff, Puyallup, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1980, Ser. No. 192,237

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—790 **16 Claims**



1. A quick change drill assembly machine, comprising:

means for feeding individual adapters to an adapter magazine, each adapter having a bore in one end to be interference fit on the shank end of a drill;

said magazine being reciprocally movable between a retracted position and an adapter supplying position;

a reciprocally movable press for receiving an adapter from said magazine in said supplying position when said press is in a retracted position;

means associated with said press for securing said adapter thereto with said bore in a predetermined position;

drill feeding means for supplying individual drills to a drill holding collet with the shank end of the drill extending outwardly of said drill collet toward said adapter bore on said press and in axial alignment therewith;

means for removably securing each drill in said drill collet; and

hydraulic means for reciprocating said press between said retracted position and to adjacent said drill collet to respectively interference fit said secured adapter to said drill and withdraw the drill from the drill collet when assembled with the adapter.

4,347,661

PROCESS OF MAKING ELECTRIC ASSEMBLIES

Franz Golla, Lünen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lüunen, Fed. Rep. of Germany

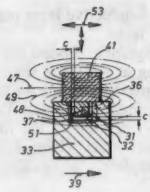
Filed Oct. 10, 1979, Ser. No. 83,733

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844222

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—879 **17 Claims**

1. Process for producing composite anode assemblies for use in electrolytic smelting, said process comprising transporting metallic holder members and recessed carbon blocks in succession through work stations, pre-coating end parts of the metallic members with an agent designed to create a separation layer with respect to a grouting material used in a subsequent bonding operation, locating displaceably-supported electrical coils around the pre-coated end parts of the metallic members without physical contact therewith, energizing the coils to dry the pre-coated end parts by induction heating in a controlled manner without cracking the coating, locating displaceably-supported electrical coils within the recesses in the carbon blocks without physical contact therewith, energizing the coils to dry the recesses by induction heating, locating the dried pre-coated end parts of the metallic members in the dried recesses, and bonding the metallic members to the carbon blocks by introducing a liquid grouting material into the recesses.



4,347,662

SHAVING APPARATUS

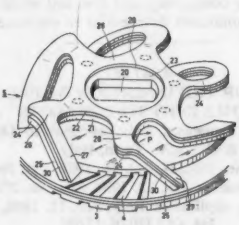
Eduard W. Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1981, Ser. No. 259,799

Claims priority, application Netherlands, Jun. 25, 1980, 8003669

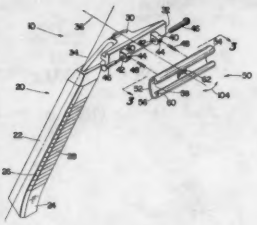
Int. Cl.³ B26B *19/42*

U.S. Cl. 30—34.2 **1 Claim**



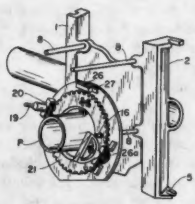
1. A shaving apparatus having a shear plate provided with hair-entry apertures and a cutting unit associated with and drivable relative to the shear plate; said cutting unit comprising a cutting element having a central body, cutters extending from said central body toward the shear plate, a hair-pulling element having a central portion, hair-pulling blades respectively associated with and movable relative to the cutters in directions respectively away from and toward the shear plate, each hair-pulling blade, with reference to the direction of driving the cutting unit, being positioned in front of its associated cutter, resilient arms respectively connecting the hair-pulling blades to said central portion, and means to secure said central portion to said central body to effect elastic coupling of the hair-pulling blades to the central body, each hair-pulling blade being normally spaced from its associated cutter throughout their respective lengths and, upon driving of said cutting unit, being movable toward and into contact with its associated cutter by reason of said elastic coupling upon contact with the hair-pulling blade with a hair.

4,347,663
SAFETY RAZOR HAVING MOVABLE HEAD
Andre A. Ullmo, 3715 Warrensville Rd., Cleveland, Ohio 44122
Filed Jan. 16, 1980, Ser. No. 112,624
Int. Cl.[3] B26B *21/22, 21/52*
U.S. Cl. 30—47 5 Claims



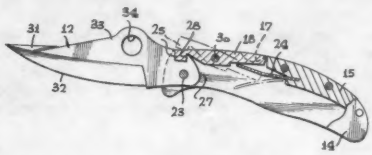
1. In a safety razor having a head for supporting at least one razor blade for use during a shaving operation, and a handle for permitting a user to conveniently guide the head during a shaving operation, the improvement comprising mounting means for attaching the head to the handle, the mounting means permitting movement of the head relative to the handle about more than one axis, the mounting means including:
(a) a hinge connecting the head and the handle, the hinge having a lost motion connection to permit translational, as well as pivotal, relative motion between the head and the handle, the hinge including:
(i) spaced tabs projecting from a selected one of the handle or the head, the tabs having laterally extending slots; and,
(ii) spaced pairs of ears protecting from the other of the selected members, the ears including aligned openings, the openings and the slots being alignable such that fastening members can pass through the openings; and,
(b) a biasing means interposed between the head and the handle, the biasing means always urging the head toward a neutral, rest position.

4,347,664
SOIL PIPE CUTTER
Felix A. Petrillo, 1143 Stowe Ave., McKees Rocks, Pa. 15136
Filed Aug. 18, 1980, Ser. No. 178,698
Int. Cl.[3] B23D *21/10*; B23B *5/14*
U.S. Cl. 30—97 1 Claim



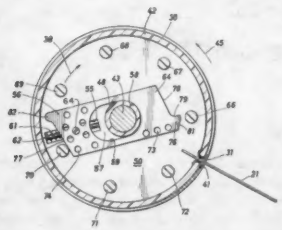
1. In a capped soil pipe mounting assembly having four horizontally extending bolts extending through a bathroom wall or the like, the combination of a pipe cutter comprising a substantially circular mounting plate having a pair of holes through which the lower two of said bolts extend and having mounted on one side thereof a ring gear, idler rollers equidistantly spaced for rotatably mounting said gear, a pipe cutting blade, and a driving pinion in meshing relationship with said ring gear and having a stud shaft which is driven by an electric portable drill so as to rotate said ring gear at a slower speed than said driving pinion, whereby upon rotation of said ring gear, said cutting blade will cut through said soil pipe externally of said wall, a pin extending from said cutting blade, said ring gear having a radially extending longitudinal slot through which extends said pin, and a leaf spring normally biasing said pin and blade radially inwardly of said ring gear, said cutting blade also having a convex shaped cutting surface having a central groove.

4,347,665
POCKET KNIFE
Louis S. Glesser, P.O. Box 800, Golden, Colo. 80401
Filed May 11, 1981, Ser. No. 262,457
Int. Cl.[3] B26B *1/02*
U.S. Cl. 30—161 5 Claims



1. A pocket knife comprising the combination of:
a handle having opposite, elongated side portions separated by a spacer defining a cavity opening from one side of said handle;
a blade pivotally carried on said handle operable between alternate positions of being stored in said cavity or being open in an operative position as an extension of said handle;
latch means resiliently biasing said blade in either of its stored or operative positions;
said blade having an enlarged portion substantially protruding from its upper top edge and outwardly projecting through said handle cavity opening beyond said handle one side so as to provide an exposed lobe;
said blade enlarged portion outwardly extending from said handle one side when said blade is in its stored position available for engagement by the flesh of the thumb of the user for actuating said blade into its operative position while said handle is held in the same hand of the user;
said enlarged portion on said blade is provided with a lateral facing depression adapted to be physically engaged by the flesh of the user's thumb to effect single-handed pivoting of said blade into its operative position.

4,347,666
APPARATUS FOR CUTTING VEGETATION
Robert J. Moore, Fontana, Calif., assignor to Emerson Electric Co., St. Louis, Mich.
Filed Jul. 25, 1980, Ser. No. 173,192
Int. Cl.[3] A01D *50/00*
U.S. Cl. 30—276 26 Claims



1. An apparatus for cutting vegetation, comprising:
(a) a head rotatable about an axis of rotation;
(b) a spool journaled for rotation within said head;
(c) said head provided at its periphery with aperture means;

(d) a supply of flexible non-metallic cutting line coiled upon said spool, and said cutting line having a free end extending from said aperture exteriorly of said head into a cutting plane;

(e) means including an elongated planar cam for selectively controlling rotation of said spool within said head for feeding increments of said cutting line into the cutting plane during rotation of said head;

(f) said cam mounted within said head in a plane transverse to the rotational axis and adapted to move laterally diametrically between initial and outward positions by centrifugal forces when said head increases in rotational speed from a first magnitude to a second magnitude;

(g) said spool having a plurality of axially-projecting pins arranged in a circle about the axis of rotation;

(h) said cam having a lug at one end thereof, and said lug engaging a projection pin on said spool with said cam at its initial position to prevent rotation of said spool relative to said head;

(i) biasing means for urging said cam into the initial position at rotational speeds of said head less than the first magnitude;

(j) said cam having a camming surface at its end opposite to said lug, and said camming surface adapted to engage a pin on said spool with said cam in its outward position whereby drag of said cutting line during vegetation cutting but not in free air travel rotates said spool within said head and moves the pin across said camming surface to return said cam from its outward position to its initial position thereby securing said spool against rotation relative to said head until its speed again increases from the first magnitude to the second magnitude; and

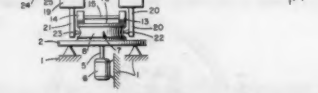
(k) said cam being responsive to increases in rotational speed to move from the initial position to the outward position and said cam being responsive to the urging of said spool to move from the outward position to the initial position whereby said spool rotates a predetermined angular displacement in said head for feeding increments of cutting line into the cutting plane.

4,347,667

APPARATUS FOR THE DIMENSIONAL CHECKING OF A BEARING RING

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Aug. 29, 1980, Ser. No. 182,684
Claims priority, application Italy, Sep. 14, 1979, 3491 A/79
Int. Cl.³ G01B 7/12, 7/28
U.S. Cl. 33—174 L **11 Claims**



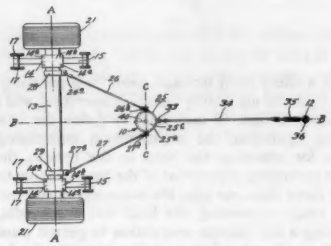
1. An apparatus for the dimensional checking of the raceway of a bearing ring, comprising measuring means including feelers adapted to cooperate with the raceway surface; supporting means for supporting the ring and the measuring means, the supporting means permitting a relative scanning motion of the feelers on the raceway surface, along a transversal direction of the raceway; control means for controlling the checking operation; and processing means connected to the measuring means, wherein said supporting means permit a further relative scanning motion of the feelers on the raceway surface in the direction of the longitudinal development of the raceway; the first scanning motion being a reciprocating motion; said control means controlling said first and further scanning motions; and wherein the processing means receive the measuring means measurement signals obtained through said scanning motions and provide signals responsive to the radial dimensions of the ring in correspondence with a plurality of cross-sections of the raceway.

4,347,668

DEVICES FOR USE IN ALIGNING AXLES

Harry R. Johnston, R.D. #4 - Box 250-G, Coatesville, Pa. 19320

Filed Mar. 20, 1978, Ser. No. 890,588
Int. Cl.³ G01B 5/25
U.S. Cl. 33—193 **2 Claims**



1. Apparatus useful in aligning the axle of a vehicle with respect to its frame, said apparatus including a case, a pair of cables of equal length having inner ends connected to said axle at spaced locations and having outer ends connected to said case at spaced locations closer together than said axle connections so that said cables converge in a forward direction from said axle, an input lever carried by said case to pivot about an upright axis, and means for connecting said input lever to a reference datum on the frame to cause said lever to pivot relative to the case into an angle corresponding to the alignment angle of the axle, gearing means coupled to said input lever, said gearing means including a sector gear connected to said input lever and a pinion gear of smaller pitch diameter meshing with said sector gear, and readout means coupled to said case and responsive to rotation of said gearing means to produce a readout corresponding to the angular disposition of said axle with respect to the frame, said readout means including an array of graduations carried on said case and a pointer coupled to said pinion and extending into registry with said array, said graduations being disposed on said case on the side thereof opposite said input lever, and said pointer being adapted to register with said graduations upon pivotal movement of said input lever, whereby the readout may be seen readily by a mechanic located remote from the apparatus.

2. Apparatus useful in aligning the axle of a vehicle with respect to its frame, said apparatus including a case, means for connecting said case to the axle, including a bracket disposed transversely to an input lever, pre-located means on said axle adjacent its median for disposing said bracket parallel to said axle and midway between the ends thereof, and means for fastening said bracket to said pre-located means, said input lever carried by said case to pivot about an upright axis, and means for connecting said input lever to a reference datum on the frame to cause said lever to pivot relative to the case into an angle corresponding to the alignment angle of the axle, gearing means coupled to said input lever for rotating in response to pivotal movement of said input lever, said gearing means including a sector gear connected to said input lever and a pinion gear of smaller pitch diameter meshing with said sector gear, and readout means coupled to said case and responsive to rotation of said gearing means to produce a readout corresponding to the angular disposition of said axle with respect to the frame, said readout means including an array of

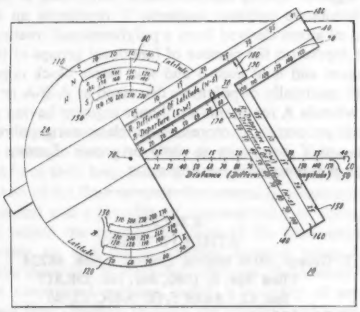
graduations carried on said case and a pointer coupled to said pinion and extending into registry with said array, said graduations being disposed on said case on the side thereof adjacent said input lever, and said pointer having an elongated arcuate slot affording movement thereof relative to the pivot axis of said lever in response to pivotal movement of said pinion gear upon angular displacement of said sector gear, whereby the readout may be seen readily by a mechanic located remote from the apparatus.

4,347,669

NAVIGATIONAL CALCULATING DEVICE

David M. McEwen, 4010 Keewahdin Rd., North Street, Mich. 48049

Continuation-in-part of Ser. No. 51,678, Jun. 25, 1979, Pat. No. 4,208,805. This application Jun. 19, 1980, Ser. No. 161,061
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.³ B43L 5/00
U.S. Cl. 33—431 **14 Claims**



1. A navigational calculating device comprised of:

(a) a plotting board,

(b) a base plate slidably mounted on said plotting board, said base plate containing intersecting horizontal and vertical scales and having at least one vertical scale adjacent a vertical edge thereof and at least one horizontal scale adjacent a horizontal edge thereof,

(c) a disk rotatably mounted on said base plate at a position coincident with the intersection of said horizontal and vertical scales, said disk comprising at least one radially spaced arcuate scale coaxial with said disk and superimposed over the vertical scale on the base plate, said arcuate scale being of constant radius and having an origin radially aligned with the intersection of said scales on said base plate, said disk having an arm affixed thereto, the lower edge of which is aligned with said intersection of the scales on the base plate, said arm containing at least one longitudinal scale, and

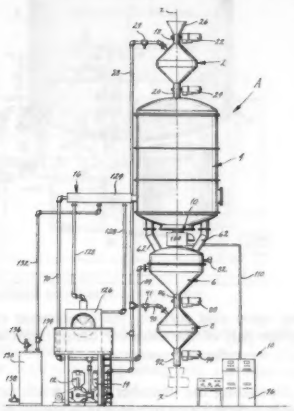
(d) a square slidably mounted on said arm, said square comprising both a vertical portion having an upper edge adjacent the lower edge of said arm and containing at least one scale having its origin aligned with the intersection of the scales on the base plate, and a horizontal portion integral with said vertical portion adapted for sliding movement relative to said arm.

4,347,670

APPARATUS AND PROCESS FOR DRYING GRANULAR PRODUCTS

Frederick C. Wear, St. Louis; Dick Q. Durant, Manchester, both of Mo., and Howard F. McKinney, Edwardsville, Ill., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 28, 1980, Ser. No. 211,308
Int. Cl.³ F26B 23/08
U.S. Cl. 34—1 **28 Claims**



1. An apparatus for drying a granular product, said apparatus comprising: an air-tight drying vessel, a portion of which is formed from a material that is transparent to microwave energy; confining means within the vessel for defining a channel through which the product passes, said means being transparent to microwave energy; a microwave launcher for producing microwave energy; a tubular waveguide-radiator connected with the launcher and being extended along the transparent portion of the vessel such that it is exposed to atmospheric air for its entire length, the waveguide-radiator containing a plurality of apertures through which the microwave energy radiates from the waveguide-radiator, with the apertures being positioned and oriented to direct the microwave energy through the transparent portion of the drying vessel and into the interior of the vessel such that the energy will pass through the confining means and evaporate the moisture from the product and means for evacuating air from the drying vessel.

4,347,671

VACUUM-DRYING METHOD AND APPARATUS

Francisco J. Dias; Willi Hannen, both of Jülich; Hartmut Luhleich, Düren, and Peter Pflaum, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jüich, Gesellschaft mit beschränkter Haftung, Jüich, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,927
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914181
Int. Cl.³ F26B 5/04
U.S. Cl. 34—15 **6 Claims**

1. A method of drying a product which comprises the steps of:

(a) disposing said product in a subdivided form in a high-vacuum-tight chamber;

(b) cooling a condenser surface in said chamber to a temperature T_2 above 0° C. but below a drying temperature T_1 of said product;

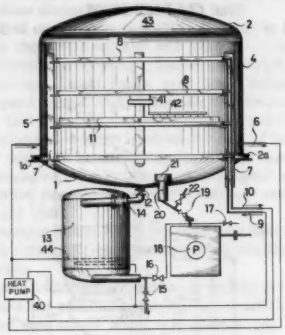
(c) evacuating said chamber to a subatmospheric pressure of substantially 5 mbar to substantially 35 mbar until noticeable condensation is observed on the condenser surface

and then terminating evacuation of said chamber, the product being heated to the drying temperature T_1 at least after termination of evacuation;

(d) maintaining said chamber sealed upon termination of evacuation and while further evacuation is halted whereby moisture from said product continues condensing upon said surface, the condensate collecting at the lower part of the chamber being repeatedly drained out into a condensate receptacle

and

(e) evacuating the chamber again when condensation subsides indicating an increase in pressure of noncondensible gases.



4,347,672

INFLOW BOTTOM FOR A FLUIDIZED BED REACTOR

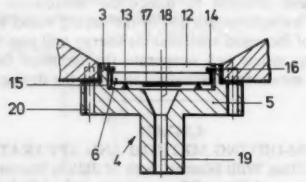
Gregor Friedrichs, Pulheim, Fed. Rep. of Germany, assignor to Thyssengas GmbH, Duisburg and Didier Engineering GmbH, Esser, both of, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,703

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1980, 3001961

Int. Cl.³ F26B *17/10*

U.S. Cl. 34—57 R **11 Claims**



1. Approach flow floor for a fluidized bed reactor for flowing a feed gas upwardly through a fluidized bed in the reactor with the approach flow floor extending transversely across the direction of gas flow, said flow floor having a number of laterally spaced openings therethrough, an approach flow body located within each of the openings in said flow floor, each said approach flow body having a lower end and an upper end, said approach flow body forming a pick-up pocket within and extending downwardly from the upper end of said flow body, a flow hole extending upwardly from the lower end of said flow body in said pick-up pocket so that the upper end of said flow hole is spaced below the upper end of said flow body, said flow hole has a widening part at the upper end thereof opening into said pick-up pocket, a distribution plate located within said pick-up pocket and spaced upwardly from the upper end of said flow hole, said pick-up pocket has a greater transverse cross-sectional area than the upper end of said flow hole and said distribution plate extends across said pick-up pocket transversely of the upward direction, a gas impermeable baffle plate on the underside of said distribution plate and aligned above the widened part of said flow hole, and the upper surface of said flow floor sloping upwardly from the edges of the openings therethrough in which said approach flow bodies are located.

4,347,673

DISPLAY SOLES FOR ARTICLES OF FOOTWEAR

Joseph F. Svetlik, Stow, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 1,035, Jan. 4, 1979, abandoned. This application Nov. 4, 1980, Ser. No. 203,928

Int. Cl.³ A43B *13/04, 13/12*

U.S. Cl. 36—32 R **9 Claims**

1. A thermoplastic sole for footwear said sole of sufficient transparency to permit display of the bottom of the article of footwear to which it is attached said thermoplastic comprising a blend of (1) predominantly elastomeric block polymer with (2) an amount of predominantly nonelastomeric block polymer sufficient to provide transparency to said blend, said block polymers chosen from among the group consisting of radial and linear block copolymers prepared from a conjugated diene containing from about 4 to 12 carbon atoms per molecule and a monovinylsubstituted hydrocarbon containing from about 8 to 18 carbon atoms per molecule wherein said radial block copolymers consist essentially of polymers described by the formulas $(A\text{-}B)_xY$ or $(A\text{-}B\text{-}A)_xY$ wherein A represents a polymer segment having nonelastomeric properties, B represents an elastomeric polymer segment, Y represents an atom or group of atoms derived from a polyfunctional treating agent, and x represents the number of functional groups of the treating agent and is at least 3 and said linear block copolymers consist essentially of polymers described as A-B-A or A-B-Y-B-A wherein A represents a polymer segment having nonelastomeric properties, B represents an elastomeric polymer segment, and Y represents an atom or group of atoms derived from a polyfunctional treating agent.

4,347,674

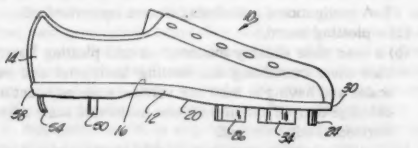
ATHLETIC SHOE

Gary F. George, 5076 Bishop, Detroit, Mich. 48224

Filed Apr. 8, 1980, Ser. No. 138,317

Int. Cl.³ A43B *5/00*; A43C *15/00*

U.S. Cl. 36—126 **6 Claims**



1. An athletic shoe comprising:

a sole,

an upper secured to said sole and extending outwardly from an upper side of the sole,

a first set of at least three narrow and arcuate cleats secured to the forward portion of said sole and extending outwardly from the lower side of said sole, each of said cleats being positioned on said sole on substantially the same radius of curvature and substantially having a common center and

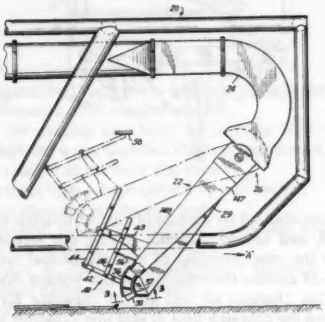
a second set of at least three narrow and arcuate cleats secured to the forward portion of said sole and extending outwardly from said lower side of said sole, said second set of cleats being positioned on said sole concentrically with said first set of cleats but on a radius from said center smaller than said first set of cleats.

4,347,675

DREDGING MEANS HAVING MEANS FOR EXCLUDING OVERSIZED SLENDER OBJECTS

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Feb. 9, 1981, Ser. No. 232,835
Int. Cl.³ E02F 3/94; B07B 1/16; B01D 35/02; B07B 1/52
U.S. Cl. 37—57 17 Claims



1. Screening means for screening long slender particles to prevent passage through a fluid-flow conduit, wherein the particles have their long dimension extending along the longitudinal axis of the flow conduit, the screening means comprising a conduit and a plurality of opposed pairs of corrugated surfaces within the conduit, the axes of the folds extending transversely to, and the corrugated surfaces being folded along, the direction of fluid-flow through the conduit, such that the corrugated surfaces define a plurality of separate serpentine flow channels through the conduit, and transverse members extending transversely along each serpentine flow channel, extending between and intersecting the opposed corrugated surfaces, intermediate the interior periphery of the conduit.

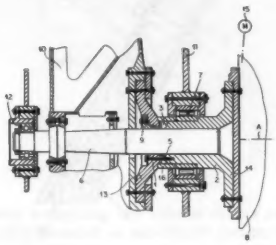
9. In a dredge means for collecting particles from the floor of the ocean, the particles entering the dredge means together with a large volume of water, the dredge means comprising: a nozzle having a nozzle inlet designed to be located adjacent to the ocean floor; liquid pumping means for drawing a flow of liquid with suspended solids into and through the nozzle inlet; and conduit means, the nozzle and conduit means defining an internal flow channel between the nozzle opening and the pumping means; the improvement comprising screening means suitable for excluding long slender objects from passing through the flow channel, the screening means comprising a plurality of pairs of opposed corrugated surfaces within a portion of the flow channel, the corrugated surfaces being folded about axes transverse to the longitudinal axis of the flow channel from the nozzle inlet to the pump, each pair of opposed corrugated surfaces defining a separate serpentine conduit for liquid flow within the flow channel and being spaced apart by a distance designed to prevent the passage of the slender objects having a dimension measured along the longitudinal axis of the flow channel which is greater than a predetermined value.

4,347,676

BUCKET-WHEEL EXCAVATOR

Peter Kersten; Peter Meixner, and Erich Müller, all of Magdeburg, German Democratic Rep., assignors to Veb Schwermaschinenbaukombinat Takraf, Leipzig, German Democratic Rep.

Filed Dec. 1, 1980, Ser. No. 211,653
Int. Cl.³ E02F 5/08
U.S. Cl. 37—94 7 Claims



1. A bucket-wheel excavator comprising:
a frame;
an unsplit-ring bearing on said frame defining an axis;
a shaft assembly having
a solid core shaft extending along said axis through said bearing
an input-side tube shaft fitted over said core shaft to one side of said bearing and having one end turned away from said bearing and formed with an input flange and an opposite end,
an output-side tube shaft fitted over said core shaft to the opposite side of said bearing and having one end turned away from said bearing and formed with an output flange and an opposite end,
angularly interengaging formations at least partially on said opposite ends rotationally coupling same together, and
means for pressing said opposite ends axially against each other;
a bucket wheel carried on said output flange; and
drive means connected to said input flange for rotating said shaft assembly and bucket wheel about said axis.

4,347,677

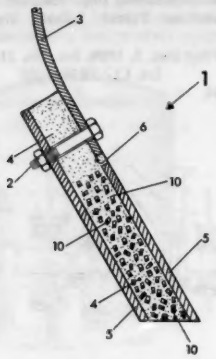
SNOW REMOVAL BAR FOR THE SNOW REMOVAL PLATE OF A SNOW PLOW

Walter Küper, Bochum-Stiepel, Fed. Rep. of Germany, assignor to Gummi Kuper GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 115,832, Jan. 28, 1980, Pat. No. 4,288,932. This application Mar. 18, 1981, Ser. No. 244,838
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2904251
Int. Cl.³ E01H 5/06
U.S. Cl. 37—233 6 Claims

1. A snow removal bar for a snow removal plate of a snow removal plow of the type including a rubber intermediary element which is reinforced with steel plates disposed on both sides thereof and which has an upper edge which is mounted by means of bolts on the lower edge of the snow removal plate, the improvement comprising:
said intermediary element having an exposed bottom edge disposed for engagement with a road surface an a multiplicity of particle-like hard material elements embedded therein and distributed within the area between said two steel plates, said hard material elements being more wear resistant and having a lower coefficient of friction than said rubber intermediary element relative to the road surfce so that they will protrude from the lower edge of

the snow removal bar in the form of rounded-off shoulders after a certain operating time, which rounded-off shoulders may slide relatively easily on the road surface,



thereby lowering the drive resistance and increasing the wear resistance of the intermediary element and, in turn, the snow removal bar.

4,347,678

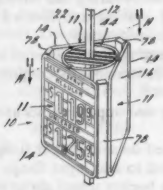
MULTI-SIDED DISPLAY DEVICE

John K. Laakso, West Bloomfield, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Jan. 15, 1981, Ser. No. 225,318

Int. Cl.³ G09F *15/00*

U.S. Cl. 40—607 **41 Claims**



1. A device for mounting a multi-sided sign display to a pole, said device comprising:

a pair of mounting means, each of said mounting means comprising hoop means and means for securely clamping said hoop means to said pole, said hoop means including a pair of tubular half circles with ends, said half circles each having an insert in one end,

a plurality of sign panels, and

means for fastening said sign panels to each of said hoop means, said fastening means being independent of said clamping means and said pole.

4,347,679

ELECTRIC RELEASE DEVICE FOR FIRE-ARMS

Kurt Grünig; Heinz Elmiger, both of Malters, and Franz Schneider, Oberweningen, all of Switzerland, assignors to Feinwerkbau, Westinger & Alterburger GmbH & Co., Oberndorf, Fed. Rep. of Germany

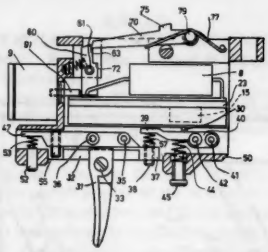
Filed Jan. 31, 1980, Ser. No. 117,126

Claims priority, application Switzerland, Feb. 13, 1979, 1378/79

Int. Cl.³ F41C *19/12*

U.S. Cl. 42—84 **8 Claims**

1. An electronic release device for a fire arm, comprising an electromagnet adapted to cause firing of said fire arm, a first capacitor connected across said electromagnet, a source of current for charging said first capacitor and an electronic switch arranged between said capacitor and electromagnet and means for firing said electronic switch to cause discharge of said first capacitor through said electromagnet comprising a trigger manipulated mechanical switch having one terminal connected to the control electrode of said electronic switch, a second capacitor connected in parallel across said electronic



switch to be charged on passage of current through said electromagnet, said second capacitor having one terminal connected to the other terminal of said mechanical switch for discharge of current therethrough, and a voltage divider for delaying the charging of said second capacitor for a time greater then the charging time of said first capacitor whereby firing of said electronic switch is possible only after said first capacitor has reached a predetermined charge.

4,347,680

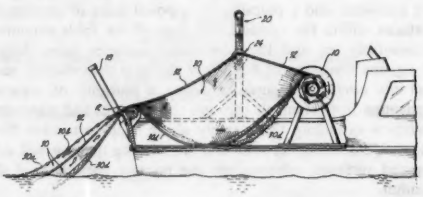
GILL NET HAULING AND FISH REMOVING SYSTEM

Eugene D. Kaestner, 208 Winesap Rd., Bothell, Wash. 98011

Filed May 5, 1980, Ser. No. 146,278

Int. Cl.³ A01K *74/00*

U.S. Cl. 43—10 **5 Claims**



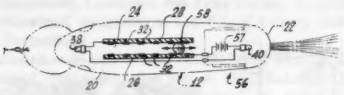
1. A gill net comprising an elongated generally rectangular net having float means distributed along its upper edge and weight means distributed along its lower edge, and having a suspender line extending the length of the net substantially midway between such edges and of a thickness at least several times thicker than the net strands, and securing means fastening the suspender line to the net strands at a substantially uninterrupted succession of points along the length of the suspender line such that with the net folded in half along said suspender line and with the halves hanging suspended from said suspender line the stresses in the net will be distributed along the length of the line, said suspender line being secured to the net on one side thereof by means comprising a backing line a minor fraction of the diameter of the suspender line placed congruently to the suspender line on the opposite side of the net, the two lines being lashed together and to the intervening mesh of the net along the length of the lines, whereby the backing line defines the fold of the net when suspended beneath the suspender line.

4,347,681

INTERMITTENTLY ILLUMINATED FISHING LURE WITH TRAVELLING ELECTRICAL CONTACT

Raoul G. Fima, 10446 N. 82nd. Pl., Scottsdale, Ariz. 85253

Division of Ser. No. 966,361, Dec. 4, 1978, Pat. No. 4,250,650.
This application Aug. 4, 1980, Ser. No. 175,149
Int. Cl.³ A01K *75/02*
U.S. Cl. 43—17.6 7 Claims



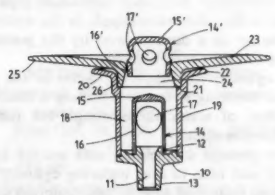
1. A fishing lure comprising:
an elongated body adapted to be pulled through the water in the direction of its longitudinal axis;
means for causing said body to oscillate as it is pulled through the water such that the front end thereof rises and falls relative to the back end thereof;
an electrical light source carried by said body;
a battery disposed within said body;
an elongated guideway extending along said body in the direction of said longitudinal axis;
a plurality of stationary spaced-apart electrical contacts arranged along said guideway;
a movable contact member disposed within said guideway and adapted to travel along said guideway under the force of gravity as said body oscillates, successively engaging said stationary contacts; and
circuit means for intermittently energizing said light source in response to engagement of successive ones of said stationary contacts by said movable contact member.

4,347,682

BUBBLE FORMING DEVICES

Walter E. Hackell, 73 Alexander Ave., Napier, New Zealand

Filed May 15, 1980, Ser. No. 149,985
Claims priority, application New Zealand, Jun. 8, 1979, 190685
Int. Cl.³ A63H *33/28*
U.S. Cl. 46—6 8 Claims



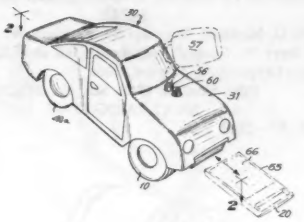
1. A bubble-forming device comprising a shallow dish-shaped bubble engaging disc having an opening centrally disposed therein, means including spaced apart inner and outer circular walls forming an open ended chamber of annular cross-section located on the convex side of the disc; the open end of the chamber being in communication with said central opening of said disc, said inner wall having a lateral aperture in communication with said annular chamber and having an air supply inlet opening concentric with the open end of the chamber and central opening of said disc, a cover detachably mounted with said disc to cover said central opening, said cover having at least one aperture therein, said aperture being located so that air entering into said chamber via said inlet opening and said lateral aperture emits from said at least one aperture over the surface of said disc.

4,347,683

CONDUCTIVE FLUID ACTIVATED DEVICES

John Maxim, 90 Ledgebrook Ave., Norwalk, Conn. 06854

Filed Sep. 3, 1980, Ser. No. 183,778
Int. Cl.³ A63H *17/00*
U.S. Cl. 46—251 26 Claims



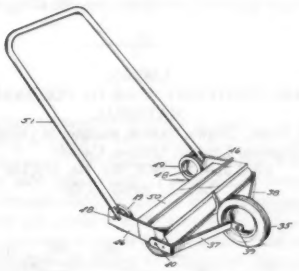
1. A device comprising toy vehicle chassis means; wheel means rotatably mounted on said chassis means; motor means mounted on said chassis means and operatively coupled to said wheel means for driving same; reservoir means carried on said chassis means capable of receiving a current conducting liquid; a pair of electrically conductive probe means in spaced relation in said reservoir means; and circuit means coupled to said probe means and adapted to be actuated when said pair of probe means are electrically coupled by said liquid, said circuit means having an output coupled to said motor means for driving said motor means, whereby a toy vehicle actuated by said liquid for driving same is produced.

4,347,684

HERBICIDE ROW APPLICATOR

John H. Keeton, P.O. Box 278, Campbellsville, Ky. 42718

Filed Sep. 5, 1980, Ser. No. 184,192
Int. Cl.³ A01C *23/00*
U.S. Cl. 47—1.5 35 Claims



1. Apparatus for applying liquid to plants, comprising
a liquid applicator roller for contacting plants and transferring liquid from the roller surface to the plants;
a liquid reservoir;
means for transferring liquid from said reservoir to said applicator roller so that a film of liquid is deposited on said applicator roller surface just before it contacts plants;
a housing for mounting said roller for rotation about a given axis, and covering said roller at the top and sides but being open at the bottom to allow the peripheral surface of the roller to rotate out of the housing open bottom, and mounting said liquid transferring means; and
means for mounting said housing so that it is spaced from the ground, and so that said applicator roller is rotatable about a horizontal axis and is spaced from the ground, said mounting means including a pair of horizontally spaced

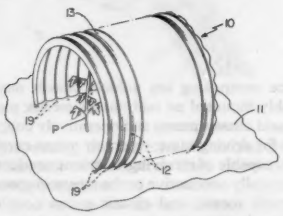
substantially horizontally elongated plates mounted to said housing and extending from one end thereof, each plate having bore means formed therein for receiving mounting pin means.

4,347,685

PROTECTIVE COVER AND METHOD OF MAKING SAME

Richard D. Medford, Waynesville; Pearison W. Henry, Sylva, and Jerry W. Cooper, Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Dec. 16, 1980, Ser. No. 217,266
Int. Cl.[3] A01G *13/00*
U.S. Cl. 47—28 R 24 Claims



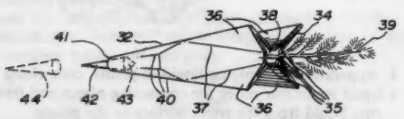
3. In a cover for protecting a plant against weather damage, said cover comprising a plurality of spaced arch-like supports and a flexible polymeric material fastened to and carried by said supports, said supports and polymeric material cooperating to define said cover having an inverted roughly U-shaped outline, said polymeric material being a synthetic plastic material which has a wall thickness generally of the order of thousandths of an inch whereby said U-shaped cover is axially collapsible from an extended configuration, the improvement wherein said arch-like supports are defined by the turns of a helically wound member which has been cut along a rectilinear line engaging all of said turns, and wherein said plastic material has said inverted U-shaped outline which has been defined by cutting a tube made of said plastic material along said rectilinear line.

4,347,686

FIN-STABILIZED CONTAINER OF FOLDABLE SHEET MATERIAL

Arthur D. Wood, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jun. 28, 1978, Ser. No. 919,798
Int. Cl.[3] A01G *23/02*
U.S. Cl. 47—73 8 Claims



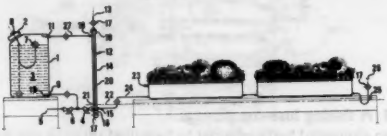
1. A fin-stabilized container formed from a unitary tapered container made from foldable sheet material, said tapered container having an apex defining the forward end and an opposite trailing end, at least three fold lines extending longitudinally from the trailing end at least partially towards the apex, said trailing end being folded inwardly toward a central longitudinal axis of the tapered container at at least three circumferentially spaced regions to form fins that project outwardly from the central longitudinal axis, each fin having outer edges defined by one of said fold lines, the folded trailing end providing closure means for the container.

4,347,687

WATERING SYSTEM FOR FLOWER POTS AND PLANT BOXES

Uwe Sibbel, Emser Strasse 44, 1000 Berlin 44, Fed. Rep. of Germany

Continuation of Ser. No. 40,883, May 21, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 224,250
Int. Cl.[3] A01G *27/00*
U.S. Cl. 47—79 1 Claim



1. A watering system for plant boxes comprising:

a water supply unit operable for filling when in a closed condition, said water supply unit having an air-tight closable cover, a top fluid passage and a bottom fluid passage;

a tube, said tube having a top fluid passage, a first lower fluid passage and a second lower fluid passage, said tube having an opening therein for a ventilation pipe;

a first fluid passage connecting said top fluid passage of said water supply unit to said top fluid passage of said tube to thereby permit flow of fluid therethrough;

a second fluid passage connecting said bottom fluid passage of said water supply unit to said first lower fluid passage of said tube;

a shut off valve located in said second fluid passage for opening and closing said second fluid passage;

a ventilation pipe for controlling the level of water in a watering cylinder, said ventilation pipe located in said tube, said ventilation pipe having a lower end located in said tube and an upper end projecting through said tube so that said upper end is above the liquid level in said water supply unit, said upper end located in communication with the atmosphere, said upper end located above said top fluid passage of said water supply unit to permit air to escape therethreough during filling of said water supply unit;

an air-tight seal located between said tube and said ventilation pipe to prevent fluid from escaping between said tube and said ventilation pipe, said ventilation pipe vertically adjustable so that the water supply in the watering cylinder can be set to a desired level by the position of the lower end of said ventilation pipe;

a watering cylinder for supplying water to the roots of a plant, said watering cylinder including a foam plug that permits flow of water therethrough but restricts root growth therethrough;

a third fluid passage connecting said second lower fluid passage of said tube to said watering cylinder to permit flow of fluid from said tube to said watering cylinder;

a water supply filling passage connected to said second fluid passage said water supply filling passage operable to be connected to a source of water to permit filling of said water supply unit when said air-tight closable cover is in a closed condition and when said shut off valve in said second passage is in a closed condition to thereby permit discharge of air in said water supply unit through said top fluid passage, said tube and ventilation pipe;

said ventilation pipe vertically adjustable within said tube to permit the vertical positioning of said lower end of said ventilation pipe in said tube to thereby control the water level in said watering cylinder;

said watering cylinder located within plant boxes and below the root level of a plant located in said plant boxes; and

said watering cylinder including a watering element for insertion into a plant box and whereby said watering element can be connected to a watering supply unit, said

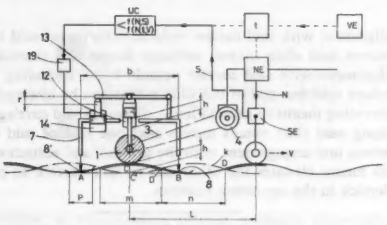
watering element including ventilation holes to permit air to discharge therethrough and means for maintaining the ventilation holes in an open position, said watering cylinder including a hole for flow of water into said plant boxes.

4,347,688

RAILROAD RAIL GRINDING TRUCK

Fredy Scheuchzer, Lausanne, and Fritz Buhler, Ecublens, both of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Switzerland

Continuation-in-part of Ser. No. 947,067, Sep. 29, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,053
Claims priority, application Switzerland, Oct. 10, 1977, 12337/77
Int. Cl.³ B24B *23/00, 49/10*
U.S. Cl. 51—178 **15 Claims**



1. A track grinding truck for grinding the tread surface of a railroad rail, which comprises at least one grinding unit comprising spaced shoes bearing on said rail, grinding means comprising at least one grinding wheel, means for driving said grinding means, means including a fluid-actuated cylinder for supporting said grinding means between said shoes in position to grind the tread surface of said rail, adjustable stop means independent of said cylinder for variably limiting movement of said grinding means toward said rail by said cylinder, and servo-action regulating means controlling said stop means as a function of the degree of wear of said grinding means and also of the undulation of said rail surface so that the point of contact between said grinding means and said rail cannot fall below a grinding base defined by a straight line connecting points of contact of said shoes with said rail.

4,347,689

METHOD FOR BURNISHING

Craig B. Hammond, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

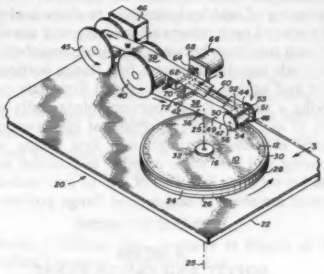
Filed Oct. 20, 1980, Ser. No. 198,714
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—281 SF **12 Claims**

1. A method for burnishing an annular region of a coated surface of a disk comprising the steps of:

rotating a disk having a coated surface about an axis substantially normal to said coated surface;

contacting said coated surface with an abrasive surface of a length of burnishing tape, said tape being oriented such that a fixed point on said coated surface of the disk first enters into intimate contact with said abrasive surface of a first segment of the burnishing tape which first segment is urged into contact with said coated surface with a first force and, after having passed said first segment, said fixed point then contacts an abrasive surface of a second segment of the burnishing tape having a common terminal end with said first segment, which second segment is urged toward said coated surface with a lesser force than said first force;

oscillating the burnishing tape back and forth across said coated surface in a path having little or no travel in a direction parallel to the length of said first or said second segments while maintaining intimate contact between both abrasive surface segments and said coated surface; and



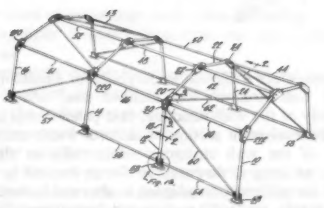
disengaging said abrasive surface of the burnishing tape from contact with said coated surface of the disk.

4,347,690

SKELETAL FRAMEWORK STRUCTURE AND JUNCTION FOR USE THEREIN

Brenton G. Wallace, Jr., 1529 Sweet Briar Rd., Gladwyne, Pa. 19035

Continuation-in-part of Ser. No. 105,026, Dec. 19, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,845
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—93 **12 Claims**



1. In a skeletal framework structure adapted to be provided with a covering or lining to form a space enclosure, comprising a plurality of parallel vertically disposed arches horizontally spaced from each other, each of said arches comprising a plurality of straight-segment tubular arch members adjacent pairs of which are joined to each other at their adjacent ends by junctions, and said adjacent ends of each of said pairs having longitudinal axes extending in a common plane and at an angle to each other, said arches being interconnected by a plurality of tubular straight-segment arch-connecting members connected to said junctions and extending at an angle to said plane, the improvement wherein at least some of said junctions comprise:

a first plate member a first surface of which is generally parallel to said common plane of the adjacent ends of the associated pair of said tubular arch members, said first surface of said first plate member bearing against one side of each of said associated tubular arch members and bridging their adjacent ends;

a second plate member a first surface of which is generally parallel to said common plane of said adjacent ends of said associated pair of tubular arch members, said first surface of said second plate member bearing against the opposite side of said associated tubular arch members and bridging their associated ends;

at least four bolt members, one pair of which extend through both of said plate members and through one of said pair of associated tubular arch members and another pair of which extend through both of said plate members and the other of said pair of associated tubular arch members;

nut means for each of said bolt members for permitting tightening of said bolt members to draw said plate members toward each other and to clamp said associated tubular arch members between said plate members;

a first angle member having a first flange portion extending over and against a surface of said first plate member and having a second flange portion substantially at right angles to said first flange portion, at least two of said bolt means extending through said first flange portion for securing said first angle member in position; and

means for securing one end of one of said arch-connecting tubular members to said second flange portion.

4,347,691

SOFFIT AND FASCIA PANEL

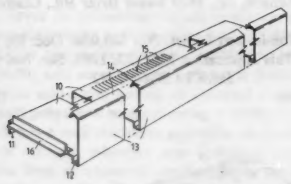
Robert Lloyd-Jones, Redcliffe, Australia, assignor to Salkhad Pty. Limited, Queensland, Australia

Filed Nov. 18, 1980, Ser. No. 207,975

Claims priority, application Australia, Aug. 4, 1980, PE4838; Sep. 19, 1980, PE5655

Int. Cl.³ E04D *13/15*

U.S. Cl. 52—95 **2 Claims**



1. A one piece soffit and fascia panel for a building having a vertical wall structure and inclined roof rafters extending outwardly of the wall structure, said panel comprising a substantially level soffit section of uniform width extending forwardly of the wall structure substantially at right angles thereto, an integral downturned flange carried by the inner edge of the soffit section adapted to abut and be secured to the wall structure, said soffit section and downturned flange being disposed bodily below said rafters, the substantially vertical fascia section extending above the soffit section and substantially abutting and lying across the ends of the rafters, vertical alignment brackets for said panel fixed to side faces of the rafters and having depending extensions projecting somewhat below the outer ends of the rafters and below the level of the soffit section of said panel, and said panel having an integral relatively narrow uniform cross section continuous channel portion formed thereon and receiving therein said depending extensions of the alignment brackets and said channel forming the juncture of the soffit and fascia sections.

4,347,692

PORTABLE DRILLING RIG

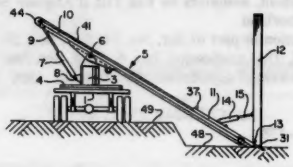
Robert B. Culver, P.O. Box 1234, Claresholm, Alberta, Canada (T0L 0T0)

Filed Aug. 25, 1980, Ser. No. 180,916

Int. Cl.³ E04H *12/34*; E21C *9/00*

U.S. Cl. 52—117 **6 Claims**

1. A portable drilling rig for mounting on a carrier vehicle comprising a turntable rotatably mounted on the vehicle for rotation therein around a vertical axis; slide means pivotally mounted on said turntable for rotation around a horizontal axis; carriage means slidably mounted on said slide means for sliding movement therealong between retracted and extended positions; a drilling derrick mounted on said carriage means for movement with said carriage means between the retracted and extended positions; elevating means for raising and lowering one end of said slide means; means pivotally connecting said derrick to said carriage means; and lifting means for raising the other end of said derrick from said carriage means to orient the derrick with the longitudinal axis thereof in the vertical, whereby actuation of said elevating means raises said one end of said slide means from a transporting position on and in



alignment with said carrier vehicle, rotation of said turntable moves said slide means, carriage means and derrick out of alignment with said carrier vehicle to an operating position where said one end of the slide means can be lowered by said elevating means to ground level, sliding of said carriage means along said slide means moves said one end of said carriage means into engagement with the ground, and actuation of said lift means elevates the other end of said derrick to place the derrick in the operating position.

4,347,693

WINDOW GLASS MOUNTING ARRANGEMENTS

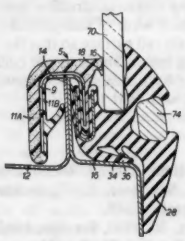
Werner Kruschwitz, Viersen, Fed. Rep. of Germany, assignor to Draftex Development, AG, Zug, Switzerland

Filed Sep. 2, 1980, Ser. No. 183,141

Claims priority, application United Kingdom, Oct. 4, 1979, 7934471

Int. Cl.³ E06B *3/62, 7/16*

U.S. Cl. 52—208 **7 Claims**



1. A window glass mounting arrangement, comprising

two separate parts assembled together to define first and second longitudinally extending channels substantially side-by-side and facing in opposite directions,

the first channel being sized to fit over and grip a support member surrounding and on one side of the window opening so that the second channel then runs along the window opening for receiving the window glass,

the first part being made of plastics material,

the second part being made of rubber material,

one said part including a first longitudinally extending portion which forms at least a component of one of the side walls of one of the channels and which has formed within it a longitudinally extending slot having walls and a base defined in the said portion,

a channel-shaped metal reinforcing carrier which is embedded in the walls and base defining the said slot and which embraces the said slot, and

the other said part defining another longitudinally extending portion which is fitted tightly within the slot and secures the two parts together,

the second part being completely free of embedded inseparable metal reinforcement on the opposite side of the window opening to the said one side.

4,347,694

METHOD OF INTERCONNECTING AND MANIPULATING PRINTED PRODUCTS

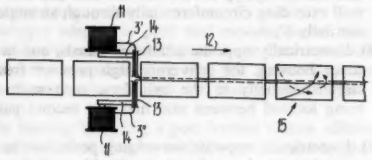
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Mar. 3, 1980, Ser. No. 126,424

Claims priority, application Switzerland, Mar. 9, 1979, 2270/79

Int. Cl.³ B65B *15/04*

U.S. Cl. 53—399 2 Claims



1. A method of manipulating printed products, especially newspapers or magazines or the like, comprising the steps of:

arranging product copies or groups of product copies in a serial row for forming a composite formation;

interconnecting the product copies or groups of product copies with one another into a band, worm-like, foldable structure, defining the composite formation by coherent tying means which engage about the product copies or groups of product copies;

forming the tying means by means of at least two traction elements extending in the length of the composite formation;

supplying from the one or the other side each of said traction elements;

passing the traction elements in a crossing fashion between the product copies or groups of product copies;

interconnecting the traction elements with one another between the product copies or groups of product copies; and

processing the folded structure in such composite formation.

4,347,695

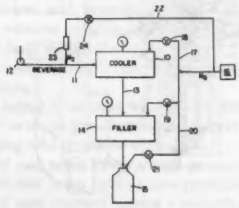
BEVERAGE BOTTLING METHOD

Frederick A. Zobel, Bedford Hills, and Joseph D. Burke, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,232

Int. Cl.³ B65B *31/00*

U.S. Cl. 53—432 5 Claims



1. A method for bottling a non-carbonated beverage in which the improvement comprises injecting 3 to 10 times the amount of nitrogen required to saturate the beverage at STP, into the beverage prior to the beverage's entry into a conventional pressure filler for standard bottling with a filling pressure of less than 100 psig, introducing the beverage containing nitrogen into a container, permitting an amount of nitrogen to escape from the beverage while the beverage is within said container and exposed to ambient conditions, said amount being sufficient to strip oxygen from the beverage and purge the head-space of the container of air while retaining a sufficient amount of nitrogen in the beverage to exert a superatmospheric pressure within the container when sealed, and subsequently sealing said container.

4,347,696

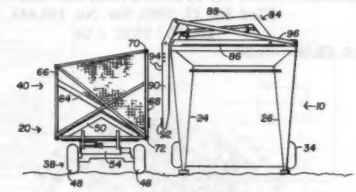
MODULE DUMP

Don R. Johnson, Lubbock, Tex., assignor to Harris & Thrush Manufacturing Company, Wolfforth, Tex.

Filed Mar. 20, 1981, Ser. No. 245,747

Int. Cl.³ A01D *44/00, 46/08, 46/20*

U.S. Cl. 56—16.6 6 Claims



1. The process of harvesting seed cotton including:

a. stripping bolls of seed cotton from the cotton stalk by harvester

b. transferring the stripped seed cotton to a trailer having a basket mounted on a running gear, and

c. moving the trailer to a module builder;

wherein the improved method of dumping the cotton from the trailer into the module builder comprises:

d. attaching hooks from the module builder onto the basket,

e. lifting the basket to above the module builder by the hooks on the module builder, then

f. tilting the basket, and

g. dumping the seed cotton into the module builder.

4,347,697

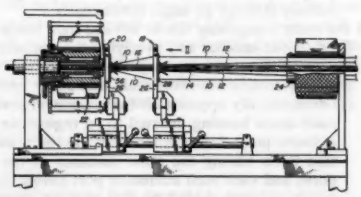
CONTROL OF A SUPPORT FILAMENT FOR OPTICAL WAVEGUIDES

Thomasz S. Hope, Kanata, and Miguel Fombellida, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 20, 1980, Ser. No. 208,838

Int. Cl.³ D02G *3/44;* D01H *13/04;* G02B *5/16*

U.S. Cl. 57—9 12 Claims



1. A device for limiting the amount of twist in a support

filament for elongate transmission elements as the elements are being laid in grooves sinusoidally along the filament, the device comprising:

a housing;

an arcuate groove follower in the shape of at least part of a circle and rotatably mounted upon the housing to rotate about the major axis of said circle while defining a passage along the axis for movement of the support filament, and comprising at least one groove follower probe extending inwardly of the follower towards said major axis for location within a groove of the support filament and effect rotational movement of the follower dependent upon the sinusoidal groove movement as the filament passes the probe; and

rotation limiting means associated with the housing and the follower to limit rotational movement of the follower between one angularly spaced limit position and another to thereby restrict twist of the filament.

4,347,698

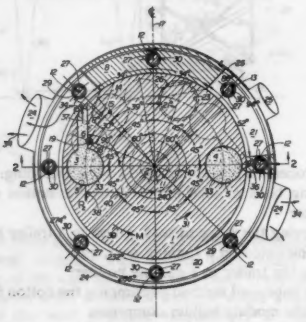
ROTARY-REACTIVE INTERNAL COMBUSTION ENGINE 2-360

Alexander Nelson, 606 E. Juneau Ave., Milwaukee, Wis. 53202

Filed Jul. 17, 1980, Ser. No. 169,643

Int. Cl.³ F02C 5/04

U.S. Cl. 60—39.34 **9 Claims**



1. A rotary-reactive internal combustion engine of the type having a stator and a rotor which is rotatable in one direction, characterized by:

A. the rotor having

(1) a shaft with a disc fixed thereto intermediate its ends, said disc having flat and parallel opposite faces,

(2) a pair of diametrically opposite cyclinders in the disc, each having a round port, said ports having the same diameter, said ports opening to opposite faces of the disc,

(3) and a reactive duct in the disc leading to its periphery from each cylinder at an angle of 90° to the cylinder axis, said ducts having the same diameter, said ducts extending in a direction opposite to that of rotor rotation and each terminating in a reactive nozzle at the periphery of the disc, said nozzles extending circumferentially through an angle substantially 8°;

B. the stator comprising similar left and right stator housings fixed to one another and overlying the opposite faces of the rotor disc, said housings having bearing means to rotatably receive the rotor shaft, said stator having

(1) diametrically opposite air-fuel admission ports, one in each stator housing, located to be registrable with the cylinder ports during rotation of the rotor, said admission ports having the same diameter as the cylinder ports, and each such admission port having an injector nozzle through which air-fuel mixture must flow to reach its respective cylinder port,

(2) diametrically opposite spark plugs, one in each stator housing, located in circumferentially spaced relation to its respective admission port by an angle of substantially 30° in the direction of rotor rotation, said spark plug located inside a niche means,

(3) diametrically opposite exhaust canals, one in each stator housing, to receive combustion gases from the cylinders, each such canal extending circumferentially through an angle of substantially 232° in the direction of rotor rotation from a location adjacent to its associated admission port,

(4) a first pair of diametrically opposite walls, one in each stator housing, located alongside the rotor periphery and extending through an arc of substantially 68° in a direction opposite to that of rotor rotation, from a location at the end of its exhaust canal first swept by the reactive nozzles in the rotor,

(5) a second pair of diametrically opposite walls, one in each stator housing, located at the end of its exhaust canal last swept by the reactive nozzles and each such wall extending circumferentially through an angle substantially 8°,

(6) diametrically opposite admission canals, one in each stator housing, for delivering high pressure fresh air circumferentially to the cylinders, each such canal being located between said first and second pairs of walls,

(7) diametrically opposite scavenging ports, one in each stator housing, located to be registrable with the cylinder ports during rotation of the rotor, said scavenging port having the same diameter as the cylinder ports and being located substantially 60° from its associated admission port in the direction opposite to rotor rotation,

(8) an exhaust pipe connected to each stator housing and leading outwardly from its exhaust canal from a location adjacent to its spark plug,

(9) an admission pipe connected to each stator housing and located to supply high pressure fresh air to its admission canal,

(10) and an outlet pipe connected to each stator housing in communication with its scavenging port.

4,347,699

EXHAUST CLEANING FLUID CONTROL SYSTEM AND VACUUM CONTROL VALVE DEVICE FOR USE THEREIN

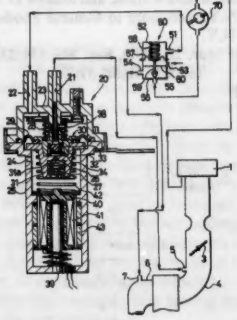
Kazuhiko Kitamura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 19, 1980, Ser. No. 208,264

Claims priority, application Japan, Dec. 10, 1979, 54-159915

Int. Cl.³ F01N 3/22

U.S. Cl. 60—290 **8 Claims**



1. An exhaust gas cleaning fluid control system including a flow control valve for metering additional air to be supplied to

the exhaust manifold of an internal combustion engine in response to vacuum signals and a vacuum control valve device for producing vacuum signals to be applied to a vacuum chamber of the flow control valve, said vacuum control valve comprising;

a housing;

a diaphragm dividing said housing into a first chamber communicating with the intake manifold of the engine and second chamber communicating with the atmosphere;

a valve assembly securely fixed to a center portion of said diaphragm and having a passage intercommunicating said first and second chambers, a spring and a movable valve body biased by said spring to normally close said intercommunicating passage;

first and second spring means provided in said first and second chambers for imposing opposite forces on said valve assembly;

a solenoid device provided in said second chamber and including a movable member supporting one end of said second spring means;

a stopper adapted to push said movable valve body when said valve assembly is displaced a predetermined distance, thereby communicating said first and second chambers with each other through said passage of said valve assembly;

said housing including a port formed therein to communicate said first chamber with a vacuum chamber portion of said flow control valve; and

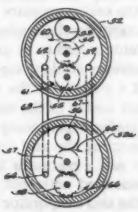
said vacuum control valve producing in said first chamber vacuum signals proportional to the intake manifold vacuum of the engine and to on-off signals applied to said solenoid device.

4,347,700

DIRECT-DRIVE HYDRAULIC PUMP-MOTOR

Harold H. Kantner, Evanston, Ill., and Stephen D. Scott, Cheyenne, Wyo., assignors to Transcience Associates, Inc., Evanston, Ill.

Filed Feb. 21, 1980, Ser. No. 123,314
Int. Cl.³ F01C *1/08;* F16H *39/06*
U.S. Cl. 60—325 **8 Claims**



1. In a fluid-power converter which is a pump-motor,

a housing which coprises a rotatable cylinder and a pair of non-rotatable end plates defining a chamber, means interposed between said rotatable cylinder and end plates permitting relative rotation therebetween,

a quantity of fluid within the chamber

at least four rotators within the cylinder and supported by the end plates,

said rotators being in contact whereby to define a plurality of pressure areas in the chamber, a plurality of said rotators engaging said rotatable cylinder,

at least one of said areas being a high-pressure area,

at least one of said areas being a low-pressure area,

at least one of said rotators having a smooth surface,

at least one of said rotators having a gear-like surface,

a smooth rotator and a gear-like rotator being in rolling contact with each other to define a displacement path therebetween whereby said fluid may be transferred from one pressure area to another pressure area,

at least one pair of similar rotators in contact with each other to provide a rolling seal between them whereby to restrict to the displacement path any fluid flow between the said areas,

a fluid-port for the low-pressure area,

a fluid-port for the high-pressure area, and

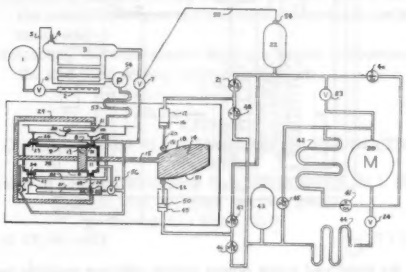
a fluid-sump defined by rotators and said rotatable cylinder, said sump being in communication with the high pressure area and the low pressure area via displacement paths.

4,347,701

POWER SYSTEM FOR LAND VEHICLES

Fletcher C. Eddens; Robert S. Moore, and Kenneth R. Munkittrick, all of Wilmington, N.C., assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1980, Ser. No. 136,897
Int. Cl.³ F01K *15/02*
U.S. Cl. 60—413 **1 Claim**



1. A hydraulically coupled engine comprising:

a first piston inside a bored cylinder, valve means for allowing pressurized steam to enter and exit said cylinder,

a rod with one end connected to first piston and the other end connected to a solid curvilinear cam shaped block with

two contoured surfaces each on a different side of the block and each a reverse curve of the other, each said surface contacting one of a pair of second piston rods at each said second piston rod's end, a pair of second pistons disposed reciprocably inside second opposed cylinders which are fixedly disposed laterally with respect to said block, each said second piston connected to a respective second piston rod for reciprocable movement therewith, said second pistons thereby acting alternately in said opposed cylinders, said second cylinders each being smaller in diameter than said first cylinder and each second cylinder containing hydraulic fluid,

a valve means for delivering said hydraulic fluid to

a pressure accumulator,

a hydraulic motor connected to fluid carrying conduit means at its input side to said pressure accumulator and said motor connected at its output side by fluid carrying conduit means to said second cylinders.

wherein said surfaces each have a length substantially equal in length to the stroke length of said first piston and each said surface is curved to form a contact angle ϕ with the second piston rod which it contacts at any point along the curvilinear block's rectilinear travel substantially according to the formula for the contact angle

$$\phi = \arctan (A_s P_s)/(AhPh)$$

in which

A_s = the circular piston face area of the said first piston,

P_s = the steam pressure on said first piston face at the position whose contact angle is being calculated,

Ah=the circular piston face area of the said respective second piston, and

Ph=a selected hydraulic pressure of the respective second cylinder.

4,347,702

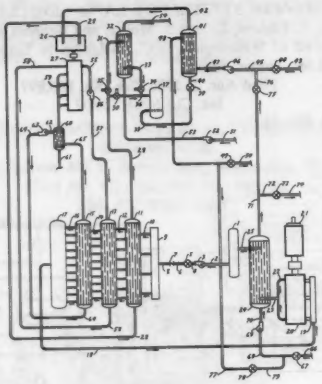
POWER SYSTEM

Ian S. Tawse, Weston, Canada, assignor to Co-Gen, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 889,250, Mar. 23, 1978, abandoned. This application Mar. 30, 1979, Ser. No. 25,354

Int. Cl.[3] F01K *23/10*

U.S. Cl. 60—618 12 Claims



1. An improved vapor power system utilizing multiple heat supplies, comprising:

a. a first closed loop comprising: an expansion engine; a refrigerant used as a propellant for said expansion engine; a pumping means for said propellant when said propellant is in liquid phase; a first heat exchange means whereat said propellant receives heat calculated to raise its energy level while said propellant is retained in liquid phase; a second heat exchange means of series connected construction whereat heats at multiple temperature levels are transferred to said propellant thereby evaporating said propellant and raising its kinetic energy to such level, whereby it performs work on the said expansion engine so that said expansion engine is made to produce useful shaft work; and condenser means for abstracting from the said propellant a portion of the heats left unutilized by the said expansion engine to return said propellant to liquid phase;

b. a second closed loop comprising: a refrigeration compressor; a heat engine for driving said compressor; a refrigerant being pumped by said compressor; an expansion valve through which the said refrigerant is expanded when pumped by the said compressor; an evaporator means wherein heat is absorbed by the said refrigerant while being expanded from the liquid to vapor phase, said refrigerant then being channelled to said compressor means whereat it experiences a temperature rise while being pumped to heat exchange with the said propellant of the said first closed loop and whereby a first heat supply is provided for the propellant of the said first closed loop and a condensing means is provided for the said refrigerant of the said second closed loop;

c. a third closed loop comprising: a pumping means; the coolant jacketing means of the said heat engine driving the compressor means of the said second closed loop; the said series connected heat exchange means of said first closed loop; and a heat transfer fluid; said pumping means placing said heat transfer fluid in circulation so as to transfer, by heat exchange, heat losses normal to the coolant system of a heat engine to the said propellant of the said first closed loop and whereby a second heat supply is provided for the said propellant of the said first closed loop and a cooling means is provided for the said heat engine driving the said compressor of the said second closed loop;

d. a fourth closed loop comprising: a pumping means; an exhaust cooling heat exchange means integrated in the exhaust system of the said heat engine driving said compressor of said second closed loop; said series connected heat exchange means of the said first closed loop; and a heat transfer fluid; said pumping means placing said heat transfer fluid in circulation so as to transfer at least a portion of the heat losses normal to the exhaust system of a heat engine to said propellant of said first closed loop and whereby a third source of heat to the said propellant is provided;

e. a fifth closed loop comprising: a pumping means; a heat exchange means wherein heats at temperatures higher than the heats conveyed in the said second, third, and fourth closed loops are obtained; said series connected heat exchange means of said first closed loop; and a heat transfer fluid; said pumping means placing said heat transfer fluid in circulation so that a fourth and highest temperature heat is transferred by heat exchange to said propellant of the said first closed loop;

f. a condenser coolant supply circuit comprising: a pumping means; a heat transfer fluid, said heat transfer fluid serving as a coolant; and the condenser means of said first closed loop; said pumping means placing said heat transfer fluid, while at appropriate temperature, in flow circumstance so that heat is abstracted from the said condenser means of the said first closed loop and whereby condensing of the said propellant of the said first closed loop is effected;

g. an evaporator heat supply circuit comprising: a pumping means; a heat transfer fluid, said heat transfer fluid serving as a heat supply means; and said evaporator means of the said second closed loop; said pumping means placing said heat transfer fluid, while at appropriate temperature, in flow circumstance so that heat supply to the said evaporator of the said second closed loop is effected;

h. a first heat transfer bypass comprising: valve and piping means interconnecting said condenser coolant supply circuit with the said evaporator heat supply circuit; and valve means associated with said condenser coolant supply circuit and the said evaporator heat supply circuit; said valve means permitting the coolant heat transfer fluid of the said evaporator means to be propelled to the inlet side of the said condenser coolant supply circuit and thereby provide at least a portion of the required cooling means for the condenser means of the said first closed loop; and

i. a second heat transfer bypass comprising: valve and piping means interconnecting the said condenser coolant supply circuit with the said evaporator heat supply circuit; and valve means associated with said condenser coolant supply circuit and the said evaporator heat supply circuit; said valve means permitting the warm heat transfer fluid leaving said condenser means to be propelled to the inlet side of the said evaporator heat supply circuit and thereby provide at least a portion of required heat for the evaporator means of the said second closed loop.

4,347,703

RANKINE CYCLE SYSTEM EMPLOYING SEASONAL TEMPERATURE VARIATIONS

William Lukasavage, P.O. Box 340, Great Meadow, N.J. 07838

Filed Jul. 27, 1979, Ser. No. 61,629

Int. Cl.[3] F03G *7/02*

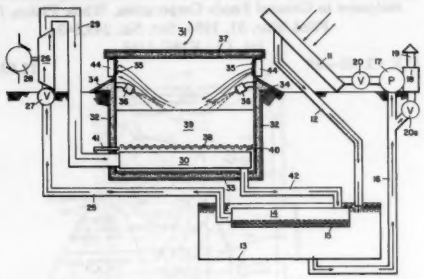
U.S. Cl. 60—641.6 10 Claims

1. In a Rankine cycle system comprising a heat source, a primary fluid heated by said heat source, a boiler for containing said primary fluid, an evaporator containing a working fluid in contact with said heated primary fluid, said working fluid being vaporized in said evaporator, a device for converting a portion of the thermal and kinetic energy of said vapor-

ized working fluid to work, and a condenser associated with a cold source for condensing vaporized working fluid exhausted from said device, said condensed fluid being introduced to said evaporator, the improvement which comprises a cold source comprising:

(a) an insulated container;

(b) means for permitting a flow of cold external air to said container;



(c) means for spraying water into said container; and

(d) a grate extending across said container and defining a space for containment of a body of water therebelow, said condensor being submerged in said body of water, whereby ice formed in said container by contact of said cold external air and said sprayed water is retained by said grate and interfaces with said body of water at about the level of said grate.

4,347,704

THERMAL POWER PLANT WATER TREATMENT PROCESS

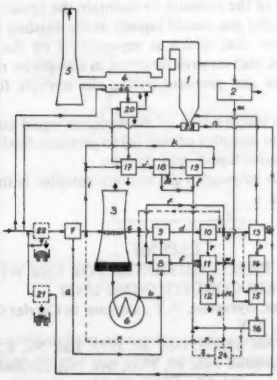
Kurt Marquardt, Holzgerlingen, and Heinz Ludwig, Sindelfingen, both of Fed. Rep. of Germany, assignors to Hager and Elsasser GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,786

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914145

Int. Cl.³ F01K *13/00*

U.S. Cl. 60—648 **12 Claims**



1. In the operation of a thermal power station, the power station including steam turbines and a steam circulation system including a steam generator and a steam generator feed water treatment stage, the power station further including at least a first cooling tower and a cooling water circulation system including the cooling tower, an improved process for the production of makeup water for the cooling water and steam circulation systems including the steps of:

providing water from a source to the power station;

subjecting at least part of the source water to a first reverse osmosis treatment;

delivering at least part of the permeate from the first reverse osmosis treatment as makeup water to the cooling water circulation system;

mixing the concentrate from the first reverse osmosis treatment with at least some of the cooling tower blowdown water to form a first mixture;

heating the said first mixture;

subjecting the heated first mixture to a second reverse osmosis treatment;

delivering at least a portion of the permeate resulting from the second reverse osmosis treatment as makeup water to the cooling water circulation system;

subjecting the concentrate stream from the said second reverse osmosis treatment to a third reverse osmosis treatment;

employing steam from the steam circulation system to heat the concentrate from the said third reverse osmosis treatment; and

extracting the solid matter from the heated concentrate of the said third reverse osmosis treatment.

4,347,705

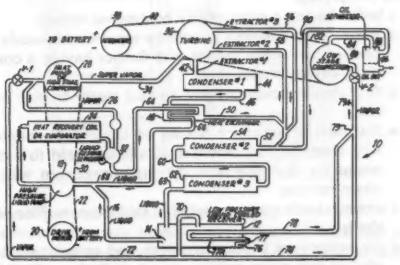
CLOSED FLUID FLOW SYSTEM FOR PRODUCING POWER

Arthur J. Mirante, 8300 Blvd. East, North Bergen, N.J. 07047

Filed Mar. 17, 1980, Ser. No. 130,873

Int. Cl.³ F01K *25/08*

U.S. Cl. 60—651 **37 Claims**



1. Closed fluid flow system for producing power from an extraneous heat source comprising

a receiver for containing volatile heat transfer fluid medium partly in the form of liquid and partly in the form of gas,

a pump for pumping liquid from the receiver,

an evaporator for passing the liquid from the pump in operative heat exchange relation with an extraneous heat source for evaporating the liquid to gas,

a high stage compressor for compressing the gas from the evaporator to high compression gas,

a gas operated prime mover for expanding the high compression gas to produce mechanical power,

a refrigerating control circuit including a liquid intake line arranged for selectively removing a control portion of the liquid from the receiver and for expanding and evaporating such control portion for cooling the contents of the receiver, a gas intake line for selectively removing a compensating control portion of the gas from the receiver, and a low stage compressor for compressing the expanded and evaporated liquid from the liquid intake line and the gas from the gas intake line to low compression gas,

condenser means for condensing and cooling the expanded

gas from the prime mover and the low compression gas from the low stage compressor, and

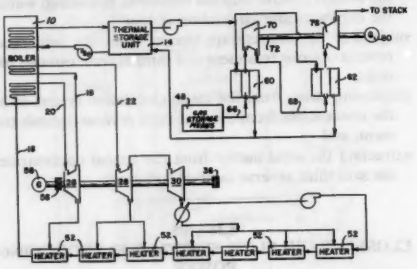
return feed means for returning to the receiver the resulting recondensed and cooled liquid from the condenser means.

4,347,706

ELECTRIC POWER GENERATING PLANT HAVING DIRECT COUPLED STEAM AND COMPRESSED AIR CYCLES

Monte K. Drost, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 7, 1981, Ser. No. 222,864
Int. Cl.³ F01K *3/00*
U.S. Cl. 60—659 **3 Claims**



1. An electric power generating plant having a predetermined base load capacity and means for storing off-peak energy for use as additional load capacity during peak load periods, comprising:

a boiler having a substantially continuous output;

a steam turbine having an energy input continuously coupled to said boiler output, and further having a continuously-driven output shaft;

a first clutch means coupled to said steam turbine output shaft;

a first electric generator having an input shaft coupled to said steam turbine output shaft through said first clutch means for disconnectable driving engagement with said steam turbine;

a second clutch means coupled to said steam turbine output shaft;

a gas compressor having an output, and an input shaft coupled to said steam turbine output shaft through said second clutch means for disconnectable driving engagement with said steam turbine;

a gas storage means having a selectively operable output, and an input connected to said gas compressor output;

thermal storage means coupled to said boiler for receiving thermal energy therefrom;

gas heater means coupled between said thermal storage means and said gas storage means output for heating stored gas outputted from said gas storage means;

gas turbine means driven by heated gas outputted from said gas storage means and said gas heater means;

a second electric generator coupled to said gas turbine means for receiving driving energy therefrom;

means for disconnecting said first electric generator from said steam turbine output shaft while connecting said gas compressor to said steam turbine output shaft during a first predetermined period of generating plant operation;

means for connecting said first electric generator to said steam turbine output shaft while disconnecting said gas compressor output shaft during a second predetermined period of generating plant operation; and

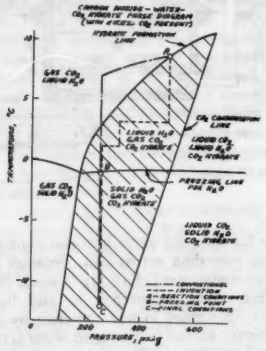
means for operating said gas storage means output so as to drive said second electric generator therewith during said second predetermined period of generating plant operation.

4,347,707

GASIFIED ICE PRODUCT AND PROCESS HAVING IMPROVED STORAGE STABILITY

Valery B. Zemelman, Wilton, Conn.; Fredric Kleiner, New City, and Michael J. Kuchman, Hopewell Junction, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,543
Int. Cl.³ F25C *1/18*
U.S. Cl. 62—69 **11 Claims**



1. A process for preparing a gasified ice characterized by a high gas content, prolonged storage stability suitable for commercial distribution in its frozen state, and a vigorous, uniform effervescence when placed in water, which comprises:

(a) contacting an aqueous liquid with a conditionally-stable, hydrate-forming gas under conditions of temperature and pressure capable of forming a chemical hydrate complex of the gas, said contacting temperature and pressure being on or below the hydrate formation line at a temperature above the freezing temperature of the aqueous liquid;

(b) maintaining said contact for a period of time effective to form a gas hydrate complex suspended in the aqueous liquid;

(c) controlling the reduction of the temperature of the aqueous liquid containing said gas hydrate complex and controlling the reduction of the pressure to maintain the pressure below that at which the gas would liquefy at the existing temperature and above that which is represented by the hydrate formation line, said control resulting in a stepwise reduction of temperature and pressure during the hydrate formation reaction;

(d) reducing the temperature of the aqueous liquid containing the gas hydrate complex of step (c) to produce final freezing of all the aqueous liquid; and thereby

(e) entrapping the suspended gas hydrate complex in the frozen aqueous liquid.

4,347,708

MAKEUP AIR PRECONDITIONER FOR USE WITH AN AIR CONDITIONING UNIT

Rudy C. Bussjager, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

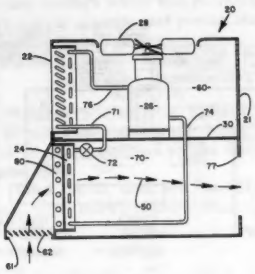
Division of Ser. No. 89,658, Oct. 30, 1979, Pat. No. 4,281,522.
This application Feb. 19, 1981, Ser. No. 235,888
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—95 **3 Claims**

1. A method of operating an air conditioning unit including a vapor compression refrigeration circuit, said unit being adapted to be connected to the return and supply ducts of an enclosure for supplying conditioned air to the enclosure which comprises the steps of:

circulating air from the enclosure through the return duct to an indoor portion of the air conditioning unit and back from the air conditioning unit to the enclosure through the supply duct;

selectively operating the vapor compression refrigeration circuit to either heat, cool or pass without temperature change the air passing through the unit from the step of circulating;

introducing ambient air into the indoor portion of the air



conditioning unit to mix with the flow of air from the step of circulating;

regulating the volume of ambient air flow introduced into the circulating air path at the indoor portion of the unit;

providing a second vapor compression refrigeration circuit in heat exchange relation with ambient air and the air being introduced into the indoor portion of the unit; and

appropriately energizing the second refrigeration circuit thereby controlling the temperature of the ambient air introduced into the circulating air flow path.

4,347,709

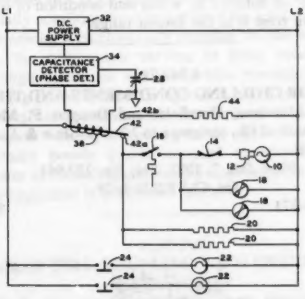
DEMAND DEFROST SENSOR

M. T. Wu, Madison, Wis., and Thomas Y. Chai, Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 19, 1981, Ser. No. 225,919

Int. Cl.³ F25D *21/02*; G08B *19/02*

U.S. Cl. 62—140 **2 Claims**



1. A demand defrost sensor for sensing and controlling the frost build up on an evaporator surface, comprising in combination:

a conductive plate disposed adjacent said surface, said plate and said surface forming a capacitor;

a high resistive material encapsulating said plate;

a first and second operational amplifier;

means for coupling a source of AC reference signal to said first amplifier;

means including said capacitor and coupling said source of AC reference signal to said second amplifier;

means for comparing an output of said first and said second amplifier, said comparing means producing a series of output pulses whose width is a function of the phase shift caused by said capacitive coupling;

means to integrate said pulses, said integrating means producing a DC signal whose magnitude is a function of said pulse width; and

means responsive to said DC signal for initiating and terminating a defrost cycle.

4,347,710

GLASS DOOR MERCHANDIZER WITH TERTIARY AIR BAND

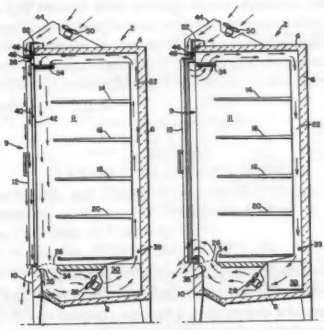
Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 101,069, Dec. 7, 1979, Pat. No. 4,265,090, and Ser. No. 107,261, Dec. 26, 1979, Pat. No. 4,265,092, and Ser. No. 124,544, Feb. 25, 1980, and Ser. No. 141,360, Apr. 18, 1980, and Ser. No. 141,359, Apr. 18, 1980, and Ser. No. 145,712, May 1, 1980. This application May 1, 1980, Ser. No. 145,750

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.³ F25D *21/08*; A47F *3/04*

U.S. Cl. 62—155 **11 Claims**



1. A refrigerated display case comprising:

a cabinet having top, bottom, rear and front walls and an interior display space, with an access opening in said front wall for enabling access into said interior display space;

at least one door covering said access opening in said front wall, said door being movable into an open position for enabling access to products in said interior display space;

a refrigeration air conduit extending along said top, bottom and rear walls and having an outlet opening and an inlet opening at opposing ends thereof, said outlet opening and said inlet opening being arranged so that air leaving said outlet opening will be directed toward and received by said inlet opening so as to form a refrigerated air curtain across said front opening along a path inside of said door;

refrigeration means including an evaporator coil arranged within said refrigeration air conduit for refrigerating air circulated through said refrigeration air conduit during a refrigeration cycle of operation;

first air circulating means for circulating air through said refrigeration air conduit;

an ambient air conduit mounted on the top of said display case, said ambient air conduit having an inlet opening located above said display case and an outlet opening arranged for directing a flow of ambient air along the front of said display case;

ambient air circulating means for circulating air through said ambient air conduit;

opening means for partially opening said door;

terminating means temporarily terminating operation of said refrigeration means; and,

control means for switching said refrigerated display case into a defrost cycle of operation, during such defrost cycle of operation said control means causes said terminating means to temporarily turn off said refrigeration means, causes said opening means to open said door and causes ambient air from said ambient air conduit to be drawn into and circulated through said refrigeration air conduit.

4,347,711

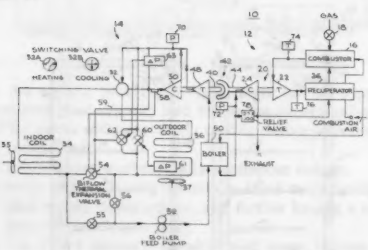
HEAT-ACTUATED SPACE CONDITIONING UNIT WITH BOTTOMING CYCLE

James C. Noe, Canoga Park, and David W. Friedman, Van Nuys, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 25, 1980, Ser. No. 172,127

Int. Cl.³ F25B *13/00, 27/02;* **F02C** *7/26;* **F02G** *3/00*

U.S. Cl. 62—160 **19 Claims**



1. Space conditioning apparatus comprising:

a Brayton cycle circuit including a combustor and a turbo-compressor comprising a turbine coupled to the output of the combustor for expanding combustor exhaust to sub-atmospheric levels and driving an associated compressor mounted together with the turbine on a single shaft;

a recuperator connected to the outlet of the turbine for preheating combustion air supplied to the combustor, the exhaust gas flow outlet of the recuperator being connected to the inlet of the compressor;

a Rankine cycle heat pump circuit comprising indoor and outdoor heat exchanger coils, a centrifugal compressor coupled to a compressor drive shaft for directing refrigeration fluid through the coils, and a transfer valve for selecting operation of the system in the heating or cooling mode;

means for deriving power to drive the Rankine cycle compressor from the Brayton cycle circuit including a bidirectional coupling for driving one shaft from the other shaft;

means for developing useful power from waste heat in the Brayton cycle circuit including a boiler interconnecting the Brayton cycle circuit and the Rankine cycle circuit to vaporize the refrigeration fluid from waste heat in the Brayton cycle circuit, and a second turbine coupled to the compressor shaft and connected to the boiler to be driven by the pressurized refrigeration fluid; and

means for starting the apparatus prior to firing off the combustor by pumping refrigerant fluid to the second turbine to initiate rotation of the turbo-compressor through the coupling.

4,347,712

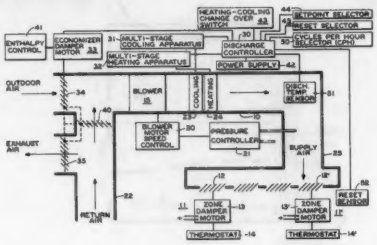
MICROPROCESSOR DISCHARGE TEMPERATURE AIR CONTROLLER FOR MULTI-STAGE HEATING AND/OR COOLING APPARATUS AND OUTDOOR AIR USAGE CONTROLLER

Ronald Benton, Minneapolis; Kenneth B. Kidder, Coon Rapids; Robert L. Linderberg, Bloomington; Timothy M. Tinsley, Coon Rapids, and Curtis E. Westley, St. Louis Park, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 3, 1980, Ser. No. 202,985

Int. Cl.³ F25B *7/00, 29/00*

U.S. Cl. 62—175 **12 Claims**



1. An improvement in a temperature control apparatus for controlling temperature conditioning apparatus having an outdoor air supply apparatus and a mechanical cooling apparatus for supplying temperature conditioning air to a plurality of zones by a blower, each of the zones having its own zone thermostat and air supply control means, the temperature control apparatus having a discharge air duct temperature sensor connected to control the temperature conditioning apparatus and adapted to respond to the temperature of the air delivered to the zones, and a second sensor adapted to respond to an environmental condition of a representative zone, the improvement comprising

first means responsive to the output of said second sensor for controlling the temperature of air delivered to the zones by adjusting the control temperature of said discharge temperature sensor as an environmental condition of said representative zone changes to maintain a maximum use of the mechanical cooling apparatus when said condition of the representative zone is in the highest range and a maximum use of outdoor air when said condition of the representative zone is in the lowest range.

4,347,713

DEVICE FOR CHILLING CONDIMENTS AND THE LIKE

Howard J. Morrison, Deerfield, and Douglas P. Montague, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 7, 1981, Ser. No. 222,961

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—371 **8 Claims**

1. A portable, self-contained device for chilling condiments and the like, comprising:

a vessel including means for containing cooling media such as ice and the like;

means for insulating said vessel and said containing means;

a carrying member removably mounted in said vessel adjacent said cooling media, said carrying member including means defining at least one compartment for containing said condiments and the like, said carrying member further comprises a portion thereof that defines both a compartment and a handle for gripping and removing said carrying member from said vessel, and a cover removably positioned on said carrying member, said cover including an opening through which said portion of said carrying member extends wherein said portion may be grasped to remove said tray and said cover.

4,347,714

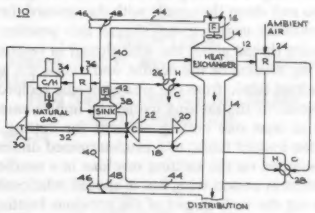
HEAT PUMP SYSTEMS FOR RESIDENTIAL USE

Robert C. Kinsell, Los Angeles, and James C. Noe, Canoga Park, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 25, 1980, Ser. No. 172,631

Int. Cl.³ F25D *9/00*

U.S. Cl. 62—402 **31 Claims**



1. Air cycle heat pump apparatus for selectively providing heating or cooling for an enclosed air space or the like, comprising:

a load heat exchanger connected to recirculation air ducting, the heat exchanger having first, recirculation air passages and second, conditioning air passages in heat exchanging relationship;

a conditioning air circuit including the load heat exchanger, a regenerator at the outlet of the load heat exchanger for initially conditioning inlet ambient air, a turbo-compressor comprising a mechanically coupled turbine and compressor, the compressor serving to drive conditioning air through the circuit and the turbine providing part of the driving power for the compressor, and a plurality of control valves to transfer interconnections within the circuit to select heating or cooling mode operation; and

a primary power source coupled to provide additional power as needed to drive the compressor for operation of the apparatus in a selected mode.

4,347,715

GEAR TYPE COUPLING WITH OVERLOAD PROTECTION

Kenneth K. Carman, Ellicott City, and Stanley G. Webb, Severna Park, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 952,628, Oct. 19, 1978, abandoned. This application Dec. 22, 1980, Ser. No. 218,876

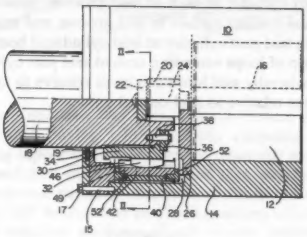
Int. Cl.³ F16D *3/18, 3/56*

U.S. Cl. 464—32 **2 Claims**

1. In a gear coupling comprising a floating shaft, hubs fixed to said floating shaft at each end thereof, said hubs having a plurality of outwardly extending gear teeth, and sleeve means having an inner axial bore operably connecting each of said hubs to a driving shaft and a driven shaft, respectively, the improvement comprising:

(a) first external intermediate sleeve element having its inner surface fixed to said inner axial bore of each of said sleeve means, said inner surface of said external intermediate sleeve element having shear connection receiving means;

(b) second internal intermediate sleeve element having an inner axial bore and an outer surface, said inner axial bore having a plurality of gear teeth adapted to mesh and coact



with said gear teeth of a respective hub, said outer surface of said internal intermediate sleeve element having shear connection receiving means;

(c) bearing means operably engaging and supporting said first and second intermediate sleeve elements; and

(d) shear connection means received in and retained by said receiving means in said external and internal intermediate sleeve elements, said shear connection means adapted to transmit a predetermined amount of torque between said elements.

4,347,716

FLEXIBLE SHAFT COUPLING

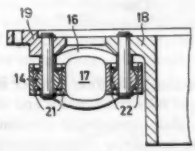
Josef Hackforth, and Jürgen Walter, both of Herne, Fed. Rep. of Germany, assignors to Hackforth GmbH & Co., KG, Herne, Fed. Rep. of Germany

Division of Ser. No. 927,958, Jul. 26, 1978, Pat. No. 4,277,958. This application Sep. 16, 1980, Ser. No. 187,740

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2834279

Int. Cl.³ F16D *3/17*

U.S. Cl. 464—83 **4 Claims**



1. In a flexible shaft coupling comprising first and second rigid coupling parts arranged concentrically one within the other, first and second annular assemblies, means attaching said first annular assembly to said first coupling part, and means attaching said second annular assembly to said second coupling part, said annular assemblies being concentric with a space between them and each of said annular assemblies including a plurality of members, and transmission means interconnecting said members to transmit torque between said rigid coupling parts, said transmission means including a plurality of elastomeric masses and a plurality of groups of radially directed filament loops, each of said groups being embedded in one of said masses and extending round one of said members in said first annular assembly and round one of said members in said

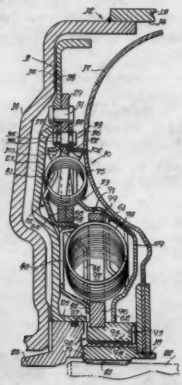
second annular assembly to interconnect said assemblies, said loops including parts between said members and elastic cushion means supporting said parts for displacement inwards into gaps between said members and within said elastomeric members, the improvement comprising means pivotally mounting each of said groups and each of said masses of elastomeric material whereby said groups and said masses can pivot relative to said rigid coupling parts about axes which are parallel to a common axis of said coupling parts, each of said members includes means defining a groove therein, and further comprising a part cylinder in each of said grooves, means defining a cylindrical bearing surface in said groove, and means slidably mounting said part cylinder on said cylindrical bearing surface, said group of loops extending around said part cylinder in said groove whereby said loops can pivot relative to said members about axes relative to said central axis.

4,347,717

TWO-STAGE TORSIONAL VIBRATION DAMPER

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 106,597, Dec. 26, 1979, abandoned.
This application Jun. 29, 1981, Ser. No. 278,262
Int. Cl.³ F16D *3/66*
U.S. Cl. 464—64 **20 Claims**



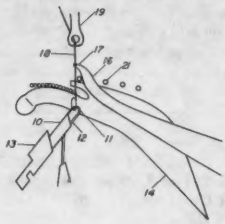
1. A two-stage torsional vibration damper assembly for the transmission of torque between driving and driven elements, comprising a piston plate operatively associated with torque input means, at least two drive tangs secured to said piston plate, a hub operatively connected to an output shaft, at least two outer floating means adapted to move in an arcuate path about the hub, at least two inner floating means adapted to move in a second arcuate path about the hub concentric to the first arcuate path, a plurality of outer damper springs movable in said first arcuate path, a plurality of inner damper springs movable in said second arcuate path, said drive tangs having projections extending inward into said first arcuate path, and an intermediate rotatable member having at least two drive members extending into said first arcuate path and at least two drive straps extending into said second arcuate path, said hub having at least two arms extending into said second arcuate path, said outer damper springs being interposed between said outer floating means and said drive members, and said inner damper springs being interposed between said drive straps and said second floating means.

4,347,718

CUTTING ELEMENTS FOR KNITTING MACHINES

William H. Haverland, Conifer, and Albert R. Hiler, Lakewood, both of Colo., assignors to Hospal Medical Corporation, East Brunswick, N.J.

Filed Oct. 3, 1979, Ser. No. 81,576
Int. Cl.³ D04B *23/06, 23/08, 23/10, 23/12*
U.S. Cl. 66—84 A **9 Claims**



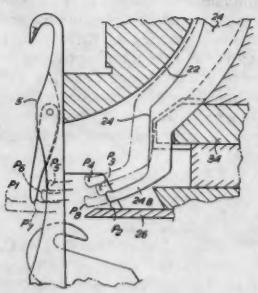
1. In a fabric knitting machine having in combination at least one needle reciprocating between a lowest and uppermost position defining a knitting cycle, means for guiding warp thread onto and about the needle with the upward thrust of the needle, means for urging a weft thread into position for knitting the warp thread about the weft thread in response to the reciprocating motion of the needle, and means for advancing the thus knitted fabric from the area of needle reciprocation at the completion of the knitting cycle, the improvement which comprises at least one cutting element for cutting the weft thread of the knitted fabric to a predetermined dimension, the element mounted on the knitting machine in a needle position for movement in unison with, but in spaced relationship to the needle, to cut the weft thread of the previous knitting cycle.

4,347,719

CIRCULAR KNITTING MACHINES FOR KNITTING ARTICLES OF TERRY FABRIC

Leopoldo Bertagnoli, Turin, Italy, assignor to Officine Savio S.p.A., Italy

Filed Mar. 6, 1980, Ser. No. 127,877
Claims priority, application Italy, Mar. 13, 1979, 9365 A/79
Int. Cl.³ D04B *35/00, 9/12*
U.S. Cl. 66—91 **3 Claims**



1. An improved double cylinder circular knitting and stocking machine for forming articles of terry fabric of the type having upper and lower cylinders, a ring of arcuate terry sinkers in the upper cylinder, each sinker having a concave edge with a concave contour and a convex edge with a convex contour, the upper cylinder having arcuate seats defining a circular path in one end of the upper cylinder, each of the sinkers being slidably received in a respective one of the arcuate seats for reciprocating angular movement, each of the

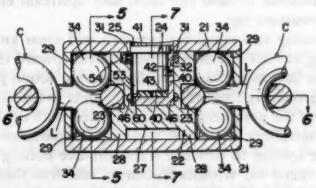
sinkers having a working end for forming a terry loop and a butt on the convex edge for controlling the reciprocating movement of the respective sinker, and a loop withdrawal ring mounted adjacent the one end of the upper cylinder for retaining the terry loop during the withdrawal of the working end therefrom in the centripetal direction, the improvement comprising, in combination therewith, each of the terry sinkers having a partially cut-away concave contour to allow rotation in the plane of the respective sinker during movement thereof in the circular path, and the upper cylinder including cam means for rotating the working end of each of the sinkers before the forward movement of the sinker so as to move the working end away from the withdrawal ring, to pass the working end over the terry loop formed on the previous course, and then to rotate the working end in the reverse direction for forming the next terry loop, and said cam means including cams for imposing both said rotation and the subsequent reverse rotation of the sinker during the completion of the forward movement of the sinker by angular sliding.

4,347,720

CHAIN LOCK

David L. Kenyon, 1727 W. Royalton Rd., Broadview Heights, Ohio 44147

Filed Nov. 13, 1980, Ser. No. 206,568
Int. Cl.³ E05B *73/00*
U.S. Cl. 70—14 12 Claims



1. A chain lock which comprises:

an outer sleeve having a hole therethrough and having an indentation in its interior surface;

an inner cylindrical case within the sleeve and capable of rotational movement within the sleeve between a locked position and an unlocked position, the case having a recess at one end for insertion of a link of a chain, the case also having a passage transverse of the recess extending from the recess to an outer end through the outer surface of the case, the indentation in the sleeve being adjacent to the outer end of the passage when the case is in the unlocked position, the case having a cylindrical bore extending into it, the bore being coaxial with the hole in the sleeve when the case is in the locked position;

a locking member movable within the passage, the locking member capable of fitting within the indentation in the sleeve to be clear of the recess when the case is in the unlocked position and capable of partially blocking the recess to retain the chain link in the recess when the case is in the locked position; and

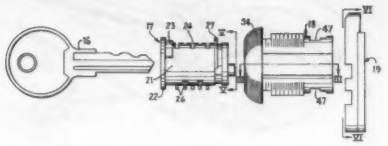
a locking device slidably receivable within the bore in the case and extending through the hole in the sleeve, the locking device having engaging means for retaining the device in the bore to hold the case in the locked position, the locking device slidably removable from the bore to permit the case to be rotated to the unlocked position.

4,347,721

PLUG-TYPE LOCK WITH INCREASED STROKE

Randall W. Borgman, Holland Township, Ottawa County, Mich., assignor to Haworth Mfg., Inc., Holland, Mich.

Filed Jul. 2, 1980, Ser. No. 165,470
Int. Cl.³ E05B *17/04*
U.S. Cl. 70—380 4 Claims



1. In a key operated lock device for a closure member, including a shell having a longitudinally extending bore; a cylinder plug supported in said bore for rotational movement relative to said shell about the axis of said plug, stop means for limiting rotation of said plug relative to said shell to a range of substantially 180° bounded by two limit positions which define locked and unlocked positions of said closure member, said plug having means defining a key-receiving slot in one end thereof and having a first generally cylindrical tenon fixed to and projecting axially outwardly from the other end thereof, the axis of said first tenon being spaced radially from said plug axis; a movable locking element coacting between said plug and said shell; and a slide bolt slidably supported on said shell adjacent said other end of said plug for movement in a first direction substantially perpendicular to said plug axis between two end positions which correspond to said locked and unlocked positions of said closure member, said slide bolt having means defining a first slot therein extending substantially transversely of said first direction, said first tenon being cooperable with said first slot during angular displacement of said plug between said limit positions to effect movement of said bolt; the improvement comprising a second generally cylindrical tenon fixed to and projecting axially outwardly from said other end of said plug, the axis of said second tenon being spaced radially from the axis of said plug and said first and second tenons each having a radius which is substantially less than the radius of said plug, the axes of said first and second tenons being angularly spaced from each other about said plug axis by an angle which exceeds 90° but is substantially less than 180°; and means defining a second slot in said slide bolt adjacent but spaced from said first slot and extending substantially transversely of said first direction, said first and second tenons respectively sequentially engaging said first and second slots during angular displacement of said plug and effecting linear displacement of said bolt through a stroke which substantially exceeds twice the radial distance between the axis of either said tenon and the axis of said plug.

4,347,722

METHOD OF MAKING A COOKING VESSEL WHICH HAS SURFACE ORNAMENTATION

John B. Ulam, 134 Mt. Blaine Dr., McMurray, Pa. 15317

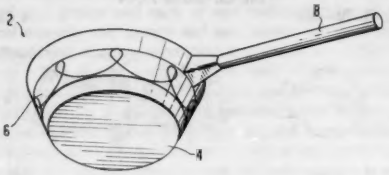
Filed May 19, 1980, Ser. No. 150,822
Int. Cl.³ B21D *51/22*
U.S. Cl. 72—63 6 Claims

1. A method of making a cooking vessel which has surface ornamentation, comprising the steps of:

deforming a metal sheet to produce a blank which has one side which has an ornamental pattern formed of areas which are raised or depressed from the principal surface of said one side,

deforming the blank to form therefrom a vessel which has interior and exterior surfaces, said step of deforming the blank being performed by engaging one side of the blank with a forming die and exerting fluid pressure on the opposite side of the blank which has the ornamental pat-

tern with raised or depressed areas, said fluid pressure being sufficient to cause said blank to deform by conforming to the surface of said forming die, said deforming step



being performed so that the side of the blank which has the ornamental pattern is located on the exterior surface of the vessel.

4,347,723

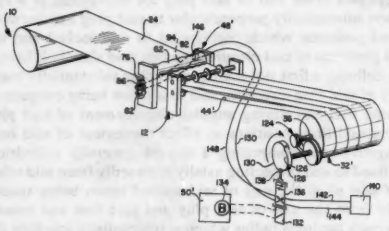
METHOD AND APPARATUS FOR TENSIONING METALLIC STRIPS ON A SLITTING LINE

Charles R. Bradlee, Sidney, Ohio, assignor to The Monarch Machine Tool Company, Sidney, Ohio

Filed Aug. 22, 1980, Ser. No. 180,534

Int. Cl.³ B21C *47/04, 47/26;* B65H *35/02*

U.S. Cl. 72—130 **20 Claims**



1. In combination with a metal slitting operation including the steps of uncoiling a web having portions of varying thicknesses from a metal coil, slitting said web into a plurality of strips having said portions of varying thicknesses, and recoiling said strips into individual strip coils, the method of tensioning strips comprising the step of:

selectively deforming only thinner ones of said portions of said web intermediate said uncoiling and recoiling steps while leaving thicker ones of said portions undeformed so that a raised pattern is imparted to said thinner ones and strips formed from said deformed thinner ones have an increased effective cross sectional thickness such that coils formed from said strips of said deformed thinner ones during said recoiling step have a larger diameter than if said thinner ones were not so deformed so that the strip coils formed from both said thinner and thicker ones of said portions are of similar diameter and the strips can be recoiled at the same rate, thereby preventing the formation of slack strips during said recoiling step.

4,347,724

METHOD AND KNIVES FOR SHEARING METAL BAR

Birchel S. Brown, Valparaiso; Ted L. Myers, Chesterton, and Holton C. Easter, Munster, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jan. 25, 1980, Ser. No. 115,446

Int. Cl.³ B23D *35/00*

U.S. Cl. 72—203 **14 Claims**

10. A method for forming a tapered end on a metal bar extending longitudinally in a downstream direction, said method comprising the steps of:

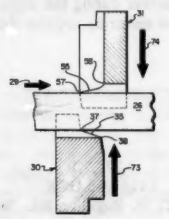
providing a first shear knife having a male section with a tapered shape protruding from said knife in the downstream direction of said bar;

said male section having an upwardly facing peripheral cutting edge extending from a pair of upstream ends to a downstream tip and defining said tapered shape;

said peripheral cutting edge on said male section having a continuous vertical drop from said upstream ends to said downstream tip;

providing a second shear knife having a female section with a tapered shape recessed into said knife longitudinally in said downstream direction of said bar;

said female section comprising means for receiving, in shearing relation, said male section of the first knife;



said female section having a downwardly facing peripheral cutting edge extending from a pair of upstream ends to a downstream tip and defining said tapered shape;

said peripheral cutting edge on said female section having a continuous vertical rise from said upstream ends to said downstream tip;

introducing said metal bar between said shear knives;

moving at least one of said shear knives toward the other to shear said metal bar, with the shearing action proceeding progressively from the upstream ends to the downstream tips of the peripheral cutting edges on both of said knives;

and controlling the shape and angular parameters of said male section to produce a scissors-like cutting action on said metal bar without fracturing said first shear knife or distorting said metal bar and with a total shearing force substantially no greater than that required to shear a flat end on said bar.

4,347,725

ROLLING BLOCKS

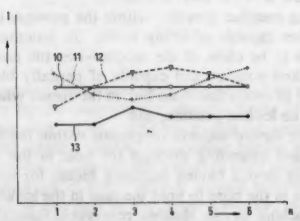
Werner Demny, Düsseldorf, Fed. Rep. of Germany, assignor to Friedrich Kocks GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Mar. 17, 1980, Ser. No. 131,058

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2913192

Int. Cl.³ B21B *31/08, 1/18, 1/00*

U.S. Cl. 72—234 **6 Claims**



1. A rolling block for the rolling of bars, rods, or wire,

having a small number of finishing sizing passes at the delivery end which shape the finished cross section with a small amount of reduction, and a larger number of working sizing passes at the entry end each of which effects a relatively large reduction in the cross section, the rolls of at least the working sizing passes being driven by a common distributor gear assembly in which a fixed transmission ratio from working sizing pass to working sizing pass is provided, the fixed transmission ratios between the adjacent working sizing passes being of differing magnitudes such that positive roll speed ratios from sizing pass to sizing pass of said working sizing pass at the entry end are provided.

4,347,726

METHOD AND DEVICE FOR BENDING SHEET-METAL SECTIONS

Gustav Näslund, Älvsbyn, Sweden, assignor to Groko Maskin AB, Lulea, Sweden

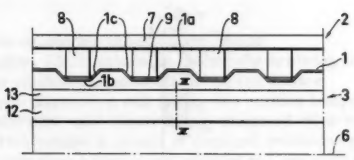
PCT No. PCT/SE79/00227, § 371 Date Jul. 3, 1980, § 102(e) Date Jul. 3, 1980, PCT Pub. No. WO80/00932, PCT Pub. Date May 15, 1980

PCT Filed Nov. 6, 1979, Ser. No. 198,943

Claims priority, application Sweden, Nov. 8, 1978, 7811538

Int. Cl.³ B21D *37/10*

U.S. Cl. 72—385 **9 Claims**



1. A method for bending a sheet-metal channel section having a bottom wall from one side of which lateral side walls extend, said method comprising suppoting a portion of said one side of the bottom wall only along interspaced mutually parallel lines of support extending transversely across the bottom wall for substantially its full width and holding the channel section against displacement from said lines only in a direction right angularly away from said one side and with said portion spanned by said lines free to move in at least one longitudinal direction of the channel, pressing only on the bottom wall's other side along a line extending substantially throughout the bottom wall's width and between said parallel lines and in addition pressing outwardly on localized portions of said side walls, which portions are in a plane normal to said one side and between said parallel lines of support, said pressings bending said portion of the bottom wall in the direction in which said lateral side walls extend and bending said portions of the side walls laterally outwardly, so as to cause the channel section to bend.

4,347,727

PROGRAMMABLE UPWARD-STROKE INSERT MECHANISM FOR BENDING BRAKES AND METHOD OF USE

Barry J. Galiger, 10915 Westgate Dr., Overland Park, Kans. 66210

Filed Jul. 28, 1980, Ser. No. 172,698

Int. Cl.³ B21D *7/06*

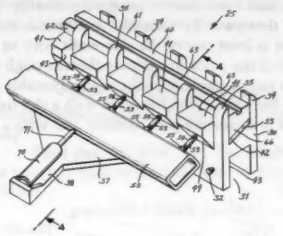
U.S. Cl. 72—389 **12 Claims**

1. A method of press brake bending a workpiece of ductile material, comprising the steps of

positioning the workpiece substantially horizontally between the upper downward-acting ram of a press brake having an elongated upper die and a lower upward-acting die holder inserted above and supported by the press bed,

lowering the upper ram and continuing until the upper die substantially contacts the workpiece, and

applying an upward camming force between the bed and the



lower die-holder and transversely thereto and by such camming force driving the die-holder upward,

whereby a die in such die-holder mating with such upper die will bend the sheet in an upward forming stroke.

4,347,728

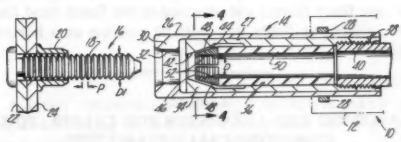
APPARATUS AND SYSTEM FOR SETTING FASTENERS

Walter J. Smith, Waco, Tex., assignor to Huck Manufacturing Company, Irvine, Calif.

Continuation of Ser. No. 43,742, May 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 899,591, Apr. 24, 1978, Pat. No. 4,208,943. This application Oct. 9, 1980, Ser. No. 195,627

Int. Cl.³ B21J *15/34*

U.S. Cl. 72—391 **18 Claims**



1. Apparatus for applying a fastener which includes a pin member having a head and a shank and a plurality of grooves therein and a tubular member adapted to be located over the shank of the pin member and swaged into some of the grooves, said apparatus comprising a generally tubularly shaped anvil member having a swaging aperture through a forward portion thereof for swaging the tubular member to the pin member, a generally tubular collet member slidably located within said anvil member and having an axial bore terminating at its forward end in a tapered bore portion, a plurality of chuck jaws defining a frusto conical outer surface adapted to generally matably fit within said tapered bore portion of said collet and each having an inner surface with a plurality of teeth thereon adapted to grip others of the grooves of the pin member, a tubular sleeve member slidably disposed in said axial bore including elastomeric means for resiliently fixedly securing said chuck jaws to a forward end of said tubular sleeve for resilient, radial movement between open and closed positions.

4,347,729

HAND RIVETER

Kiyoshi Mitani, No. 3-1-13, Minamikosakai-cho, Yao-shi, Osaka-fu, Japan

Filed Nov. 25, 1980, Ser. No. 210,243

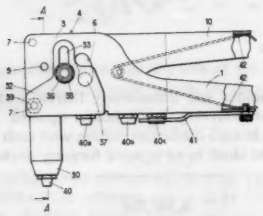
Claims priority, application Japan, Jul. 17, 1980, 55-101632[U]

Int. Cl.³ B21J *15/34*

U.S. Cl. 72—391 **7 Claims**

1. A hand riveter comprising a frame main body having a

head opened at least at its upper, lower and front portions to provide opposite side walls, a lever turnably supported by a pivot on the side walls, a jaw case support member turnably mounted on the pivot and having a jaw case pivotably supported thereon, and a jaw case housing supported by the pivot upwardly and downwardly turnably, the frame main body being formed in at least one of the side walls with an opening positioned around the pivot for passing therethrough a pin for locking the jaw case support member in an adjustable position, the lever being formed around the pivot with a slot for permitting turn of the jaw case support member and with a hole for



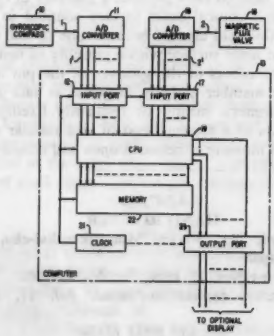
passing the locking pin therethrough, the jaw case support member being formed with locking pin bores arranged around the pivot at least at two locations angularly displaced from each other about the pivot approximately by 90 degrees, the jaw case support member being turnably attached to the lever by a jaw case support pin inserted through the slot, the locking pin being removably inserted through the opening in the frame main body, the hole in the lever and either one of the bores in the jaw case support member, the jaw case housing having the jaw case fitted therein and attached to the frame head fixedly but angularly shiftably to a vertical position or a horizontal position.

4,347,730

METHOD AND APPARATUS FOR CALIBRATING GYROSCOPICALLY-STABILIZED, MAGNETICALLY-SLAVED HEADING REFERENCE SYSTEM

Matthew J. Fisher, Eatontown, N.J., and William J. Gregory, Jr., Pelham, N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 5,255, Jan. 22, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,780
Int. Cl.³ G01C *17/38*
U.S. Cl. 73—1 E **22 Claims**



1. Apparatus for compensating for errors in the heading output signal of a magnetic azimuth detector mounted in an aircraft, comprising:

inertial heading reference means for providing a heading reference signal in accordance with the heading of said aircraft,

heading compensation means responsive to said heading output signal and said heading reference signal for compensating said heading output signal for said errors in accordance with the differences between said heading output signal and said heading reference signal at a plurality of predetermined headings of said aircraft, and

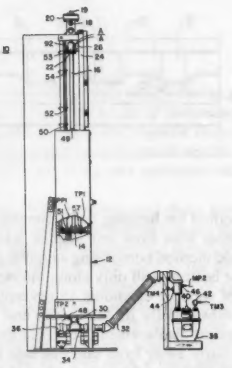
drift compensation means for compensating said heading reference signal for drift of said inertial heading reference means with respect to said plurality of predetermined headings, thereby providing a compensated heading output signal compensated for said errors.

4,347,731

CONTROL APPARATUS FOR METER PROVER

Harry W. Fisher, and Eugene B. Perrine, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1980, Ser. No. 136,513
Int. Cl.³ G01F *25/00*
U.S. Cl. 73—3 **5 Claims**



1. Apparatus for calibrating a fluid flow meter under test, said apparatus comprising:

(a) a housing of known volume having an opening;

(b) means for directing a known volume of fluid through said housing;

(c) conduit means coupled to said opening for transmitting fluid between said housing and the fluid flow meter under test and for exhausting fluid from said housing;

(d) drive means energizable for disposing said directing means in a first direction whereby fluid is driven from said housing through said conduit means, and energizable for disposing said directing means in a second direction opposite to the first direction, whereby fluid is drawn into said housing through said opening;

(e) first and second distinct valves each independently actuatable between open and closed positions, said first valve associated with said conduit means to control the passage of fluid between said housing and the fluid meter under test, said second valve associated with said conduit means to permit the exhaust of fluid from said housing; and

(f) control means operative in a first mode for actuating said drive means for disposing said directing means in its first direction while actuating said first valve to its open position and said second valve to its closed position, operative in a second mode for actuating said drive means for disposing said directing means in its second direction while actuating said second valve to its open position to permit

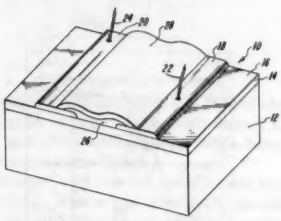
the exhaust of fluid from said housing and said first valve to its closed position, and operative in a third mode wherein each of said first and second valves is disposed to its closed position and said directing means is actuated to increase the pressure within said housing and said conduit means to conduct a leak test.

4,347,732

GAS MONITORING APPARATUS

David J. Leary, 2832 Eagle Dr., Ft. Collins, Colo. 80526

Filed Aug. 18, 1980, Ser. No. 179,218
Int. Cl.[3] G01N *27/12*
U.S. Cl. 73—23 8 Claims



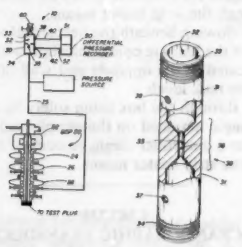
1. Gas monitoring apparatus comprising:
a support which includes an electrically insulating surface;
a pair of electrodes spaced apart on said surface;
a sensor disposed on said surface in a position bridging said electrodes, said sensor being composed of a material which exhibits a change in electrical conductivity in response to exposure of said material to a gas to be sensed;
and a molecular sieve integrally overlying said sensor on the side thereof opposite said surface, said sieve being composed of a porous solid material and having a discrete pore size no larger than the molecular size of said gas to be screened.

4,347,733

BLOWOUT PREVENTOR TEST SYSTEM

Jack A. Crain, 107 Fabiola, Lafayette, La. 70508

Filed Oct. 3, 1980, Ser. No. 193,549
Int. Cl.[3] G01M *3/28*
U.S. Cl. 73—40.5 R 9 Claims



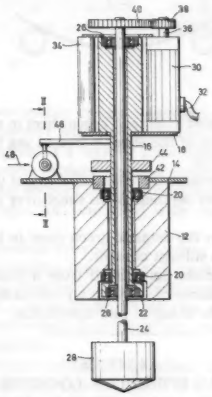
1. A testing apparatus for a blowout preventor comprising:
a. a test nipple having cylindrical wall defining therewithin a flow conveying bore;
b. bore constriction means placed at the central portion of said bore for restricting flow through said bore;
c. a pair of openings provided in said nipple for porting said nipple respectively on each side of said orifice;
d. instrumentation means for connecting one end portion of said nipple to a blowout preventor;
e. valve means at the opposite end portion of said nipple for releasing pressure from said nipple; and
f. a pair of instrumentation lines connected respectively to said pair of openings, the opposite end portion of each of said respective instrumentation lines being connected to a differential pressure recorder.

4,347,734

ROTARY VISCOMETER

Werner Heinz, Dabringhauser Strasse 72, Koeln, Fed. Rep. of Germany

Filed Jun. 25, 1980, Ser. No. 162,945
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925904
Int. Cl.[3] G01N *11/14*
U.S. Cl. 73—59 14 Claims



1. A rotary viscometer comprising a variable speed electric drive motor having a rotor and a stator, said variable speed drive motor also including a speed indicator such as a tachogenerator or a similar device, a measuring shaft driven by said motor, a measuring member at one end of said measuring shaft for immersion in a medium to be measured, said motor stator being rotatably mounted on a base block by means of a support and subjected to the return force of a spring, the rotary deflection of said stator from a rest position being measurable over a short path, characterized in that the force path between said motor and measuring shaft includes at least one pair of exchangeable gears or toothed belts, and one of a plurality of springs having different characteristics is selectively insertable between said motor support and said base block and further characterized in that said support is part of a hollow shaft and the measuring shaft extends through and is mounted in said hollow shaft.

4,347,735

PROCESS FOR MONITORING SOLVENT CONTENT OF GREEN CERAMIC SHEET, AND APPARATUS THEREFOR

Kamalesh S. Desai, Wappingers Falls, and George E. Melvin, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,044
Int. Cl.[3] G01N *3/20, 33/38*
U.S. Cl. 73—73 9 Claims

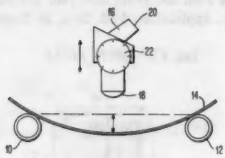
1. A process for determining the solvent content of a ceramic green sheet containing particulate ceramic material, an organic binder resin, and a solvent that interacts with the resin comprising,

partially supporting a ceramic green sheet in a manner that a portion of the sheet is unsupported and free to sag,

measuring the rate of sag of said portion of ceramic green sheet,

comparing the rate of sag to a correlation of rate of sag versus solvent content for similar ceramic green sheets to determine solvent concentration.

6. An apparatus for determining the solvent content of a ceramic green sheet containing particulate ceramic material, an organic binder resin, and a solvent that interacts with the resin comprising,



a means to support a ceramic green sheet in a manner that at least a portion of the sheet is free to sag under the influence of gravity,

a means to determine the distance of sag of the unsupported portion of said ceramic green sheet over a timed interval and

a correlation for the ceramic green sheet to be tested of rate of sag versus solvent content,

the solvent content determined from a comparison of the measured distance of sag over a predetermined time interval to the rate of sag of said correlation.

4,347,736

CONTINUOUS BOREHOLE-LOGGING METHOD

Ulmas D. Mamadzhanov, kvartal Ts-1, dom 19, kv. 25; Vitold M. Bakhir, proezd Gaidara, 7a, kv. 17; Stanislav A. Alekhin, Chilan zar, kvartal 24, dom 53, kv. 89, and Tatyana M. Bakhir, proezd Gaidara, 7a, kv. 17, all of Tashkent, U.S.S.R.

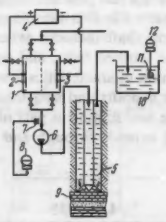
PCT No. PCT/SU79/00118, § 371 Date Nov. 27, 1980, § 102(e) Date Nov. 25, 1980, PCT Pub. No. WO80/02053, PCT Pub. Date Oct. 2, 1980

PCT Filed Nov. 28, 1979, Ser. No. 224,551

Claims priority, application U.S.S.R., Mar. 26, 1979, 2736516

Int. Cl.³ E21B *49/00*

U.S. Cl. 73—155 **1 Claim**



1. A method of continuously logging a borehole in the course of drilling with the use of a drilling mud, characterized in that it includes subjecting the drilling mud fed into the borehole to unipolar electric treatment, while measuring at the same time the value of the oxidation-reduction potential of the drilling mud, and maintaining this value substantially constant at a given magnitude; continuously measuring the value of the oxidation-reduction potential of the drilling mud returning from the borehole, comparing the last-mentioned value with the given value of the oxidation-reduction potential of the drilling mud fed into the borehole, and using the difference between the two values for determining for a given moment the mineralogic composition of the rock adjacent to the bottom of the hole, by comparing this difference with the known in advance normal oxidation-reduction potentials of minerals.

4,347,737

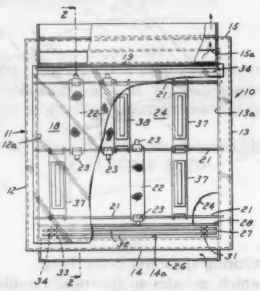
HIGH TEMPERATURE OUTDOOR WEATHERING CHAMBER

Kenneth A. Beach, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1981, Ser. No. 249,525

Int. Cl.³ G01N *25/00*

U.S. Cl. 73—159 **5 Claims**



1. A high temperature outdoor weathering chamber approximating the passenger compartment of an automobile body, comprising:

a box open at the top and having insulated side and end walls;

the top of the box having a hinged closure of standard automobile window glass;

a sample rack positioned within the box below the glass to support samples for exposure to natural sunlight;

an aluminum heat shield positioned below the sample rack to control the distribution of air through the box and to provide a heat sink;

an air intake slot extending substantially across the width of the box at the base of one end wall;

strip heater means mounted within the box contiguous to said one end wall and between the air intake slot and the heat shield;

partition means for channeling airflow from the air intake slot through the strip heater means;

the air then flowing beneath the heat shield to an opening at one end of the latter in communication with an exhaust air outlet located in the opposite end wall of the box above the sample rack level;

the airflow through the box being solely by convection;

a thermocouple mounted on the sample rack adapted to be coupled to a controller means to control the temperature input of the strip heater means.

4,347,738

OCEANOGRAPHIC TRANSDUCER

Edward L. Sanderson, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1968, Ser. No. 758,157

Int. Cl.³ G01W *1/00*

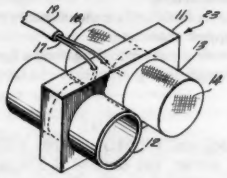
U.S. Cl. 73—170 A **10 Claims**

1. A transducer for producing an electrical signal indicative of and proportional to the current flowing within a predetermined fluid comprising:

a first electrode disposed within said predetermined fluid so as to be in contact with the current flowing therein and

having a surface which produces a galvanic action when disposed in contact with said predetermined fluid;

a second electrode of the same material as said first electrode spatially disposed from said first electrode and having a surface for contact with said predetermined fluid when immersed therein;



a fluid permeable means enclosing said second electrode in such manner as to permit the surface thereof to be contacted by said predetermined fluid while being isolated from the current thereof; and

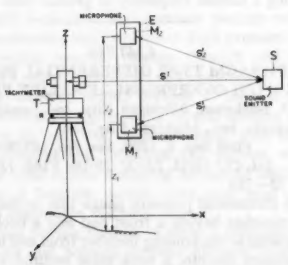
means connected to said first electrode, to said second electrode enclosing means, and effectively to said second electrode for the supporting thereof in a predetermined geometrical configuration.

4,347,739

MEASURING EQUIPMENT FOR THE DETERMINATION OF TERRESTRIAL REFRACTION

Horst Stegmann; Wolfgang Meyl, and Peter Hentschel, all of Dresden, German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed May 27, 1980, Ser. No. 153,344
Int. Cl.³ G01W *1/00*
U.S. Cl. 73—170 R **13 Claims**



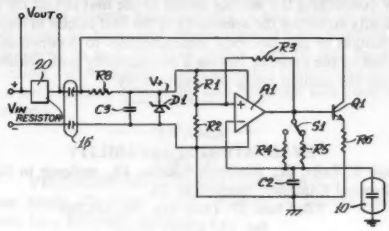
1. A measuring system for determining terrestrial refraction, comprising a geodetic measuring instrument, a device for measuring the difference of travel time of sound waves, said device for measuring the difference of travel time of sound waves comprising a sound emitter adapted to be positioned at a location remote from said measuring instrument to direct sound toward said instrument and a pair of sound receivers positioned to receive sound from said emitter along two different paths that are spaced apart at said measuring instrument for determining the difference of travel times of the sound waves, and a calculator at said measuring instrument for determining said refraction from said difference of travel time.

4,347,740

CAPACITIVE LEVEL SENSING DEVICE

Lawrence B. Townsend, Downers Grove, Ill., assignor to Magnetrol International, Incorporated, Downers Grove, Ill.

Filed Nov. 13, 1979, Ser. No. 93,392
Int. Cl.³ G01F *23/26*; G01R *27/26*
U.S. Cl. 73—304 C **3 Claims**



1. A capacitance sensing circuit comprising:

a voltage comparator with two inputs and an output, said output having either a high or a low state depending on the relative value of signals at said inputs;

a reference signal source connected with one of said inputs;

an unknown capacitor connected with the other of said inputs;

a resistor connected between said output and said other input, said capacitor charging and discharging through said resistor to develop a signal which causes said comparator output to change state and develop an output signal having a period which depends on the capacitance of said unknown capacitor;

a transistor having a collector connected to the output of said comparator; and

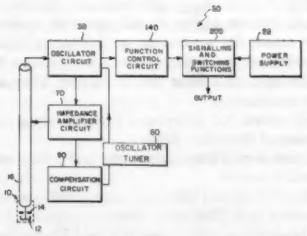
a current sensor connected to said collector so that a signal having the same period as the output signal is developed across said current sensor.

4,347,741

CONTROL SYSTEM FOR A CAPACITIVE LEVEL SENSOR

Wolfgang Geiger, Greenwood, Ind., assignor to Endress & Hauser, Inc., Greenwood, Ind.

Filed Jul. 17, 1980, Ser. No. 169,835
Int. Cl.³ G01F *23/26*; H03J *1/02*
U.S. Cl. 73—304 C **13 Claims**



1. In a control system for a capacitive level sensor of the type which includes a probe having a sensing element arranged therein to establish a capacitance between the sensing element and a grounded conductive member which changes in response to the presence of a material, a shielding element interposed between the sensing element and the conductive member, and a first circuit for applying generally the same electrical potential to both the sensing element and the shielding element

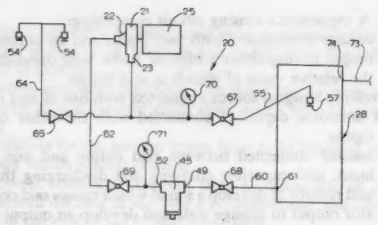
to establish an electrically neutral field between the sensing element and the conductive member and thereby reduce the effect of a conductive buildup of material on the probe within a limited range of conductivity, the improvement which comprises a means for sensing an electrical characteristic of the shielding element which is related to the conductivity of the buildup of material on the probe and a second circuit electrically connecting the sensing means to the first circuit for automatically adjusting the sensitivity of the first circuit in response to changes in the electrical characteristic to compensate for buildup of the material having a conductivity both within and outside the limited range of conductivity.

4,347,742

EVALUATING SPRAYABILITY

Joseph E. Lohr, Jr., Hoffman Estates, Ill., assignor to Stepan Chemical Company, Northfield, Ill.

Filed Sep. 29, 1980, Ser. No. 191,901
Int. Cl.³ G01N *33/00*
U.S. Cl. 73—432 SD **15 Claims**



1. A test apparatus for duplicating on a miniature scale the behavior of a commercial scale spray apparatus to evaluate behavior of specific sprayable systems under generally controlled conditions, said apparatus comprising:

(A) pump means for pumping a sprayable fluid through said test apparatus having a generally uniform volumetric output of fluid at a predetermined fluid output pressure, said pump means having pump input and output means,

(B) variable drive means associated with said pump means for varying the volumetric output of fluid from said pump,

(C) reservoir means having an elongated interior configuration and having reservoirs inlet and outlet means, said outlet means being located in a gravitationally lowermost region of said reservoir means,

(D) orifice means associated with said reservoir inlet means and adapted to discharge generally into the interior gravitationally bottom region of said reservoir means,

(E) filter means for separating particulate material over a predetermined maximum particle size from a fluid past therethrough, said filter means having filter input and output means,

(F) nozzle means for spraying a predetermined volume of said pumped sprayable fluid,

(G) first tube means interconnecting said pump means with said orifice means,

(H) second tube means interconnecting said reservoir outlet means with said filter input means,

(I) third tube means interconnecting said filter output means with said pump input means,

(J) fourth tube means interconnecting a predetermined location in said first tube means with said nozzle means,

(K) first pressure sensing means associated with said first tube means for measuring fluid pressure therein,

(L) second pressure sensing means associated with said filter means for measuring fluid pressure in the region of said filter output means,

(M) means for introducing a fluid into said reservoir,

(N) first valve means located in said fourth tube means for controlling flow through said fourth tube means,

(O) second valve means located in said first tube means between said predetermined location and said orifice means for regulating flow through said first tube means,

(P) the distance between said reservoir inlet means and outlet means in said reservoir means being not more than about 50 centimeters,

(Q) the aperture of said orifice means being not greater than about 0.5 square centimeters,

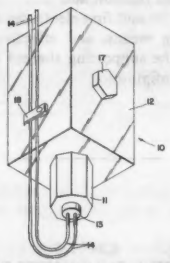
(R) said reservoir means including means for evaluating the contents thereof during operation of said test apparatus.

4,347,743

ACCELEROMETER MOUNTING ASSEMBLY

Frank Rausche, Aurora, and Garland E. Likins, Jr., Newbury, both of Ohio, assignors to Pile Dynamics, Inc., Cleveland Heights, Ohio

Filed Sep. 18, 1980, Ser. No. 188,362
Int. Cl.³ G01P *15/09*
U.S. Cl. 73—654 **10 Claims**



1. An accelerometer assembly for attachment to a specimen to be monitored for acceleration which comprises:

a mounting block capable of attachment to the specimen, the block formed of a rigid material, the proportion of the modulus of elasticity to the density of the material being less than 15,000,000 psi/lb/in^3; and

an accelerometer mounted to the block, the accelerometer having a natural frequency of greater than 30,000 Hertz.

4,347,744

DIAPHRAGM TYPE DIFFERENTIAL PRESSURE GAUGE WITH OVERPRESSURE RELIEF PROTECTION

Steven O. Buchanan, Michigan City, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Sep. 8, 1980, Ser. No. 185,004
Int. Cl.³ G01L *13/02, 19/06*; F16K *13/04*
U.S. Cl. 73—715 **11 Claims**

1. In a differential pressure gauge that includes an annular housing member having a front end and a back end, a front cover secured to the housing member front end in hermetically sealed relation thereto, a back plate secured to the housing member back end, with said housing member and said back plate defining a pressure cavity, a flexible diaphragm clamped between said housing member back end and said back plate and disposed across said pressure cavity and separating same into a high pressure chamber on the front side of said diaphragm and a low pressure chamber on the back side of said diaphragm, and including linear to rotary motion transforming means including a helix journaled in said housing member for rotation about its longitudinal axis, with the helix having an indicator connected thereto disposed adjacent and visible through said front cover, a magnet mounted in said high pressure chamber for producing rotational movement of said helix about its said axis in response to linear movement of the magnet alongside and lengthwise of said helix axis, with said helix axis extending

longitudinally of said housing member, means for connecting said diaphragm to said magnet whereby deflection of the diaphragm under differential pressures in said chambers produces said linear movement of said magnet, said diaphragm having a marginal edging thereabout comprising a continuous sealing bead, with said housing member back end and said back plate respectively defining annular clamping surfaces between which said diaphragm bead is clamped for hermetically sealing said chambers from each other about said diaphragm, which surfaces are coextensive with said bead, and means for separately connecting said high and low pressure chambers to sources of high and low pressure fluids, respectively,

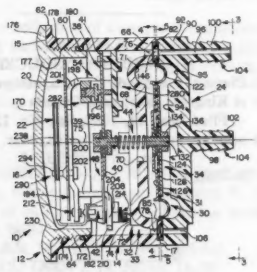
the improvement wherein:

said means for connecting said high pressure chamber to the source of high pressure fluids comprises:

a high pressure passage formed in said housing member and having its inlet end aligned with said diaphragm bead at said clamping surface of said housing member back end and its outlet end communicating with said high pressure chamber,

a high pressure passage formed in said back cover plate and having its inlet end adapted for connection to the source of high pressure fluid and its outlet end aligned with said inlet end of said housing member high pressure passage and said diaphragm bead at said clamping surface of said back plate,

said bead being apertured between and being in sealing relation about said housing member high pressure inlet



end and said back plate high pressure passage outlet end for communicating said back plate high pressure passage to said housing member passage through said bead in hermetically sealed relation to said chambers,

said housing member having formed in same a blowout passage extending longitudinally of said housing member and having its inlet end communicating with said high pressure chamber and its outlet end aligned with said diaphragm bead at said clamping surface of said housing member at a location spaced from said bead aperture along said diaphragm marginal edge,

said back plate having formed in same a blowout passage aligned with said housing member blowout passage and having its inlet end aligned with said housing member blowout passage and said diaphragm bead at said clamping surface of said back plate and its outlet end directed rearwardly of said back plate,

said bead being in sealing relation about said housing member blowout passage outlet end and said back plate blowout passage inlet end and defining therebetween an impervious flangible membrane,

said housing member and back plate high pressure passages and said diaphragm aperture communicating therebetween being similar in effective orifice area,

said housing member and back plate blowout passages each having an effective orifice area that is a predetermined multiple of said effective orifice area of said housing member and back plate high pressure passages and said aperture therefor,

said effective orifice area of said housing member and back plate high pressure passages and said aperture therefor being of rounded opening configuration aligned with said diaphragm bead,

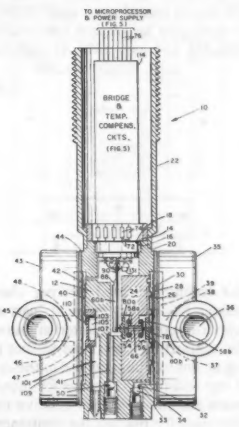
said effective orifice area of said housing member and back plate blowout passages being of elongate opening configuration that extends longitudinally of said bead for orienting same to have said predetermined area multiple as compared to said effective orifice area of said housing member and back plate passages within the confines of the hermetic sealing defined by said bead and said clamping surfaces.

4,347,745

PRESSURE MEASURING APPARATUS

Gurnam Singh, Riverside, Calif., assignor to Bourns Instruments, Inc., Riverside, Calif.

Continuation of Ser. No. 219,418, Dec. 22, 1980, abandoned.
This application Oct. 6, 1981, Ser. No. 309,331
Int. Cl.³ G01L 9/06
U.S. Cl. 73—721 **9 Claims**



1. An apparatus comprising:

a pressure transducer including:

a body having first and second spaced apart sides and a first chamber therebetween;

a first pressure sensing diaphragm connected to and extending across said first chamber to form a fluid tight cover at said first side;

means for respectively applying a fluid at first and second pressures to said first and second sides to cause a resultant differential pressure to be applied across said first diaphragm;

a cantilever beam having first and second ends with said first end being connected to said body between said first and second sides;

a strut element coupling said second end of said beam to said first diaphragm for producing a movement in said beam in response to the differential pressure applied across said first diaphragm;

a first plurality of piezoresistive elements attached to said beam for deflection therewith being responsive to the movement of said beam in response to the differential pressure applied across said first diaphragm for providing a first output signal proportional to said differential pressure;

a second pressure sensing diaphragm disposed within said first chamber and having a front side exposed to the

second pressure at said second side and a back side fixedly attached at its periphery to said body to form a second chamber between said back side and said body, said second chamber containing a predetermined reference pressure; and

a second plurality of piezoresistive elements selectively positioned on said front side of said second diaphragm for deflection therewith and being responsive to the differential between the second and reference pressures for providing a second output signal proportional to said second pressure.

4,347,746

TESTING OF SHIPPING CONTAINERS

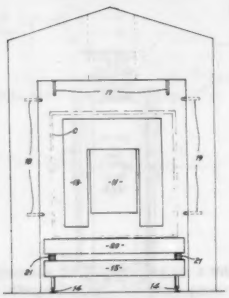
Kevin R. Waters, 1 Little St., Maroubra, New South Wales, Australia (2035)

Filed Aug. 14, 1979, Ser. No. 66,460

Claims priority, application Australia, Apr. 2, 1978, PD8258

Int. Cl.³ G01L *5/00*; G01M *5/00*

U.S. Cl. 73—789 **7 Claims**



1. Means for testing the load bearing characteristics of a shipping container having doors at at least one end thereof comprising supporting means mounted at one end in a supporting housing for supporting a test load so that the test load and said supporting means can be received in the container through open doors at one end thereof, means for moving the test load supporting means and the container relative to each other in a longitudinal direction for placing the container around the test load, elevating means for elevating the container so that the test load is transferred from said supporting means to the container, support means in said supporting housing for supporting the container in the elevated position when the elevating means are lowered and means for measuring stresses or strains in the container whilst it is under load and in said elevated condition.

4,347,747

SINGLE PHASE FLOW MEASUREMENT

Srinivasan Krishnaswamy, Columbus, Ohio, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 12, 1981, Ser. No. 224,409

Int. Cl.³ G01F *1/20*; E21B *47/00*

U.S. Cl. 73—861.18 **3 Claims**

1. A method for measuring single phase fluid flow rate in a pipe comprising:

measuring the fluid pressure fluctuations in the pipe at two diametrically opposite positions;

taking the different of said measured pressure fluctuations;

electronically filtering said different to pass only signals above 30 Hz and below 1000 Hz;

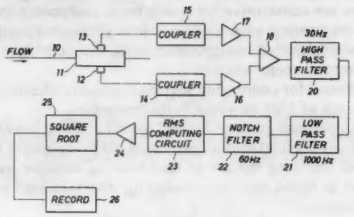
taking the RMS value of the filtered difference in said measured pressure fluctuations; and,

taking the square root of the RMS signal, said square root being proportional to the fluid flow rate.

2. An apparatus for measuring fluid flow in a pipe comprising:

two pressure transducers, said transducers being mounted on said pipe with their sensitive surfaces flush with the inner surface of the pipe;

differential amplifier means, said transducers being coupled to said differential amplifier means to obtain a difference signal;



filter means, said filter means being coupled to said differential amplifier means to attenuate frequencies below 30 Hz and above 1000 Hz;

RMS circuit means coupled to said filter means for obtaining the RMS value of the different signal; and,

a square root circuit, said RMS circuit means being coupled to said square root circuit means to obtain the square root of the RMS signal.

4,347,748

TORQUE TRANSDUCER

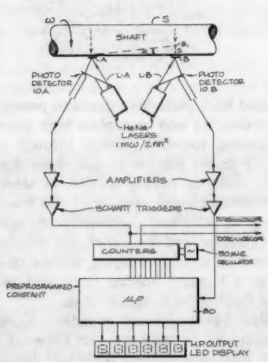
James G. Pierson, Longueuil, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed Mar. 11, 1980, Ser. No. 129,211

Claims priority, application Canada, Mar. 27, 1979, 324262

Int. Cl.³ G01L *3/12*

U.S. Cl. 73—862.34 **19 Claims**



1. Apparatus for measuring torque (or functions derived therefrom or related thereto) transmitted by a shaft driven to rotate and connected to a load comprising:

(a) first and second optically flat, radiation reflecting, surfaces located on the shaft at respective first and second positions displaced from one another axially along the shaft;

(b) means for directing beams of radiation from a suitable source at the reflecting surfaces;

(c) first and second pickup means spaced from the shaft and located to receive the radiation beams reflected by the respective first and second reflecting surfaces during rotation of the shaft and provide respective first and sec-

ond outputs as a result of the radiation beams directed thereat by the reflecting surfaces;

(d) signal processing circuit means associated with said first and second outputs providing an output interrelated with angular twist of the shaft at one of said first and second positions relative to the other, and

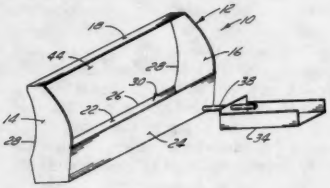
(e) at least one aperture between at least one said first and second reflecting surfaces and the pickup means associated therewith through which the reflected beam passes prior to striking the pickup means.

4,347,749

PRESS ROLLER CONTAMINATION MEASUREMENT

Hans U. Heintze, 1100 Dr. Penfield Ave., Apt. 512, Montreal, Canada (H3A 1A8)

Filed Jan. 26, 1981, Ser. No. 228,189
Int. Cl.³ G01N *1/08*
U.S. Cl. 73—863.21 **8 Claims**



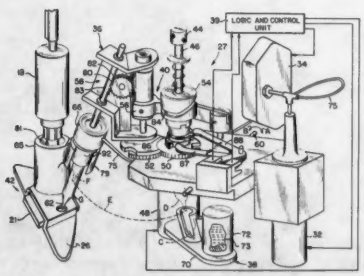
5. Method for the collection of a sample of contaminant from a paper-contacting surface comprising isolating a minor portion of said surface, said portion having a bottom border, moving said contaminant from said portion across said bottom border and collecting said contaminant.

4,347,750

POTENTIOMETRIC METERING APPARATUS

Glenn E. Tersteeg, Honeoye Falls, and Anthony P. DiFulvio, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,561
Int. Cl.³ G01N *1/14, 27/46, 35/06*
U.S. Cl. 73—864.31 **5 Claims**



1. Reference fluid metering apparatus for use with a sample fluid metering device to substantially concurrently deposit a sample fluid onto a first test area and a reference fluid onto a second test area of a generally planar, potentiometric test element supported in a metering station, the reference fluid metering apparatus comprising:

(a) reference fluid supply means supported in a location spaced from the metering station;

(b) dispensing means including a metering tip angularly arranged for receiving reference fluid located in the supply means and for delivering a predetermined quantity of the reference fluid to the second area of the test element, the dispensing means being selectively movable between a at least a position overlying the supply means and a second position in which the metering tip is positioned over the second test area and closely adjacent the first test area of the test element and disposed at an angle to the sample fluid metering device;

(c) drive means for moving the dispensing means between the first and second positions; and

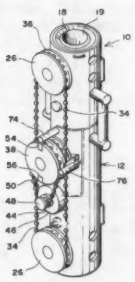
(d) logic and control means for automatically con[illegible]ng the operations of the sample fluid metering device, dispensing means and drive means to effect the delivery of fluids to the first and second test areas at substantially the same time.

4,347,751

ELECTRIC WATER SAMPLING DEVICE

Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140, and Gerald J. Williams, 485 Ridgewood Rd., Dade County, Fla.

Filed Jan. 14, 1981, Ser. No. 225,100
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—864.33 **14 Claims**



1. A water sampler device for collecting a sample of water at a desired depth in a body of water, said water sampler device having an elongated tubular member, valve seat means mounted at each end of said tubular member; substantially spherical valve means mounted on each of said valve means in an initially closed position to prevent contaminated surface waters of said body of water from entering into said tubular member, valve rotating means connected to each of said valve means for consecutively rotating each of said valve means from said closed position to an open position to permit the flow of fluid through said tubular member when said device has arrived at said depth in said body of water and then to a further closed position to contain water in said tubular member, each said valve rotating means including valve pulley means rotatably mounted on the exterior of said tubular member, the improved said valve rotating means comprising:

at least one endless belt mounted over at least one of the two said pulley means;

an electric motor for moving said endless belt;

first position changing means for energizing said electric motor to move said valve means from said initially closed position to said open position;

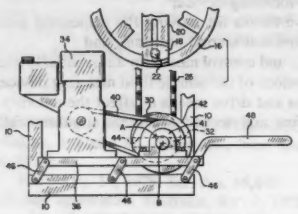
second position changing means for energizing said electric motor to move said valve means from said open position to said further closed position.

4,347,752

APPARATUS FOR CONVERTING ROTARY MOTION TO A RECTILINEAR FORCE

Frederick L. Dehen, P.O. Box 11278, Houston, Tex. 77016

Filed Aug. 18, 1980, Ser. No. 178,836
Int. Cl.³ F16H *21/14, 35/02*
U.S. Cl. 74—84 R 9 Claims



1. Apparatus for converting rotary motion to a rectilinear force, comprising:

(a) drive means for providing a rotary power output having a constant rotational speed;

(b) an eccentrically unbalanced flywheel arranged for being rotatingly driven by said drive means;

(c) cam mechanism means, interconnecting said drive means and said flywheel, for rotating said flywheel such that for each rotation of said drive means said flywheel first makes a portion of a revolution at a rotational speed which is greater than said constant rotational speed and then completes said revolution at an average rotational speed which is less then said constant rotational speed; and

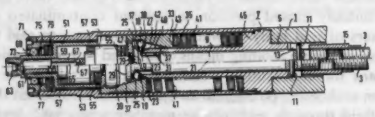
(d) alignment means associated with said cam mechanism means, for varying the angular position of said flywheel at which said portion of a revolution, at a rotational speed which is greater than said constant rotational speed, begins.

4,347,753

MECHANISM FOR OPERATING A COLLET CHUCK

Reimer Claussen, Altusried, and Liebhard Jung, Nesselwang, both of Fed. Rep. of Germany, assignors to A. Ott GmbH, Kempten, Fed. Rep. of Germany

Continuation of Ser. No. 941,172, Sep. 11, 1978, abandoned. This application Mar. 19, 1980, Ser. No. 131,780
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741166
Int. Cl.³ B23B *31/10;* B23C *5/26;* F16H *21/44*
U.S. Cl. 74—110 6 Claims



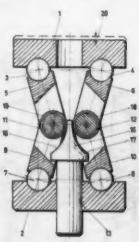
1. A spindle mechanism for operating a collet chuck, comprising an elongated tube member having an axis and a first surface portion on one end of said tube member which forms a first angle of inclination relative to a plane perpendicular to the axis of said tube member and a second surface portion which forms a second angle of inclination relative to the plane perpendicular to the axis of said tube member, said first and second surface portions being serially connected in the direction of the axis of said tube member thereby forming an edge on one end of said tube member which edge extends in the plane perpendicular to the axis of said tube member, an elongated rod member mounted for movement in the direction of the axis of said tube member over a certain path between a release position and a clamp position, one end of said rod member having a conical surface facing said first surface portion on said tube member, a sleeve member mounted for movement in the direction of the axis of said tube member for moving said rod member between said release and said clamp positions, said sleeve member having at least two surface portions each facing said tube and rod members, said at least two surface portions being angularly inclined relative to each other and serially connected in the direction of the axis of said tube member, means for biasing said sleeve member to move said rod member toward said clamp position, and a number of ball members arranged in force transmitting relationship between one of said first and said second surface portions of said tube member, said conical surface of said rod member and one of said at least two surface portions of said sleeve member, said at least two surface portions of said sleeve member forming corresponding angles of inclination relative to the axis of said tube member in the longitudinal cross-section thereof which corresponding angles are selected so that said ball members transfer a larger ratio of the rate of movement of said sleeve member to said rod member when said rod member begins to move away from said release position in response to forces exerted by said ball members on the conical surface of said rod member, and so that said ball members transfer a lesser ratio of the rate of movement of said sleeve member to said rod member after said ball members move over said edge on said tube member and said rod member is urged toward said clamp position to transmit a clamping force to a collet chuck provided at the other end of said rod member in response to forces exerted by said ball members on the conical surface of said rod member, said ball members remaining in force locking engagement with said tube, said rod and said sleeve members over the full path of movement of said rod member.

4,347,754

FORCE AMPLIFIER

Herbert Wehler, Neunkirchen-Salchendorf, Fed. Rep. of Germany, assignor to Optima Spanntechnik GmbH, Siegen, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,989
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913506
Int. Cl.³ F16H *21/44, 25/18*
U.S. Cl. 74—110 5 Claims



1. Force amplifier with a pressure plate and a countersupport plate in spaced apart relation, a spreader bolt axially movably supported in said countersupport plate and extending toward said pressure plate, supporting members arranged between said pressure plate and said countersupport plate, said supporting members are inclined relative to one another, end bolts 3, 4, 7, 8 extending transversely of the longitudinal direction of the force amplifier between said pressure plate and countersupport plate are supported between the ends of said supporting members 5, 6, 9, 10 facing away from one another and said pressure plate 1 and said countersupport plate 2, joints bolts 11, 12 are supported on the ends of said supporting members 5, 6, 9, 10 which face one another with said supporting members 5, 6, 9, 10 bearing against said joint bolts 11, 12,

wherein said spreader bolt has a pair of oppositely facing spreader surfaces thereon located between said pressure plate and countersupport plate with each said spreader surface in contact with a different one of said joint bolts, said spreader surfaces in contact with said joint bolts are concavely shaped, and said concavely shaped spreader surfaces are curved exponentially so that the ratio of the travel distance **28** of said pressure plate **1** to the distance of pressing in said spreader bolt **14** is constant.

4,347,755

WINDOW LIFTER

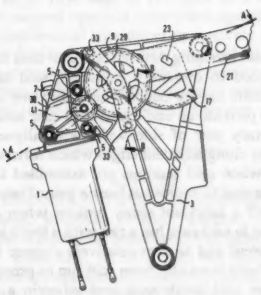
Herbert Becker, Coburg, and Josef Tischler, Lichtenfels, both of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,108

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904292

Int. Cl.³ F16H *1/12, 57/04*

U.S. Cl. 74—421 A **6 Claims**



1. Window lifter particularly for use in motor vehicles, comprising a base plate, an electric motor, a window lifting arm supported on said base plate, means in operative engagement with said electric motor and said window lifting arm for transmitting the driving power from said motor to said lifting arm, said means including an axially extending pin having a first end and a second end, a pinion rotatably mounted on said pin intermediate the first and second ends thereof, said pinion having a first end face and a second end face each extending transversely of the axial direction of said pin and facing in opposite directions, a gear having a larger diameter than said pinion and concentrically rotatably mounted on said pin with said pinion, said pinion and gear rigidly interconnected at the second end face of said pinion for rotation together on said pin, the first end of said pin is fixed to said base plate, wherein the improvement comprises that the first end face of said pinion contacts said base plate, a stirrup secured to the second end of said pin and said stirrup extending transversely of the axial direction of said pin laterally outwardly from the diametrically opposite sides of said gear and said stirrup is attached to said base plate laterally outwardly from both of the opposite sides of said gear, said pinion includes a flange formed as a unit with said pinion and forming the first end face of said pinion and said first end face formed by said flange in combination with said base plate forms a lubricant pocket.

4,347,756

TRANSMISSION

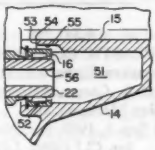
Yoshitaka Sogo, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1980, Ser. No. 173,750

Claims priority, application Japan, Apr. 3, 1980, 55/45143[U]

Int. Cl.³ F16H *57/04, 7/26*

U.S. Cl. 74—467 **7 Claims**



1. A transmission including an outer housing having a main portion and an elongated portion extending therefrom, input shaft means rotatably connected to said main portion for connecting the transmission to a source of power, output shaft means rotatably secured in said housing for transmitting output torque from an engine, counter shaft means rotatably secured in said housing for drivingly connecting said input shaft means to said output shaft means, said counter shaft means having one end rotatably mounted in at least first bearing means positioned in said elongated portion, said elongated portion having upper and lower sections, said upper section including first trough means for collecting oil transported by said output and counter shaft means and for directing that oil to said lower section, said lower section comprising a second trough means extending at least in part beneath said first trough means so as to collect oil flowing therefrom, said second trough means having an inclined V-shaped upper surface terminating at means defining an opening positioned above said first bearing means, means defining a chamber beneath said second trough means within said lower section in which said first bearing means and one end of said counter shaft means are exposed, said second trough means further including means defining a passageway undercut beneath said V-shaped upper surface leading away from said opening between said first bearing means and said second trough means into said chamber.

4,347,757

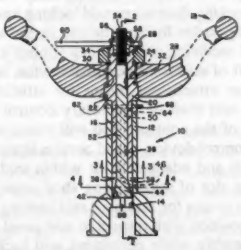
TELESCOPING STEERING SHAFT

Michael D. Martin, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 10, 1980, Ser. No. 205,532

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—493 **13 Claims**



1. A telescoping steering shaft comprising:

a first elongated shaft defining an axially-extending bore therein, said bore being substantially circular and including an axially-extending keyway therein;

a second elongated circular shaft received for reciprocation in said bore, said second shaft including spaced axially-extending, resilient tangs frictionally engageable with said first shaft;

means engaging said tangs for moving said tangs into frictional engagement with said first shaft;

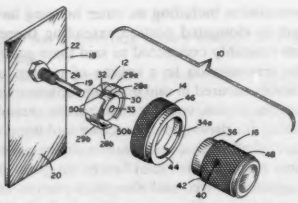
a key extending radially outwardly between said tangs and slidably received in said keyway to couple said shafts for rotation in unison.

4,347,758

MOLDED PLASTIC CONTROL LOCK KNOB

Ronald J. Geil, Vermilion; Richard E. Tinker, Westlake, both of Ohio, and Robert A. Carmo, Placentia, Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 3, 1980, Ser. No. 183,957
Int. Cl.³ G05G *5/06*
U.S. Cl. 74—531 **9 Claims**



1. A locking device for use with an adjustable rotary control member of the type having a rotary shaft fixedly mounted through a panel, said locking device comprising:

a locking shoe assembly having a means for fixedly attaching said locking shoe assembly to said panel so as to remain rotationally fixed thereto wherein the rotary shaft extends axially through said locking shoe assembly, a circumferential receiving slot, and at least one locking shoe integrally attached at one end to said locking shoe assembly with an internally inclining outer cam surface wherein the distal other end of said locking shoe is free to move radially inward into said receiving when force is applied thereto;

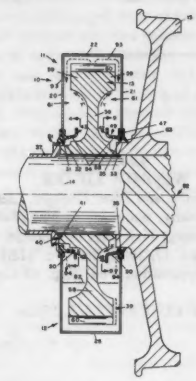
an annular locking knob circumferentially mounted over said locking shoe assembly so that said shaft of said rotary control member is in axial alignment and extends through said locking knob and wherein said locking knob is free to move rotationally about said locking shoe assembly, said locking knob having at least one internally inclining internal cam being dimensioned so as to be closely adjacent with said internally inclining outer cam of said locking shoe when said locking knob is in an unlocked position and adapted to contact said internally inclined outer cam of said locking shoe when said locking knob is rotated into a locked position forcing the free end of said locking shoe into said receiving means; and a control knob mounted on said shaft of said rotary control device, said control knob having an attachment means for attaching said control knob to said shaft of said rotary control member so that rotation of the control knob will rotate said shaft of said rotary control device, a land portion integrally attached to said knob and adapted to fit within said circumferential receiving slot of said locking shoe assembly, an integral retention means for retaining said locking knob in a longitudinal position with respect to said panel and said locking shoe assembly while permitting said locking knob to rotate about said locking shoe assembly so that when said locking knob is in siad unlocked position said control knob is free to rotate and when said locking knob is in said locked position said at least one locking knob internal cam forces said at least one locking shoe into said receiving slot binding said land portion in said receiving slot thus preventing said control knob from being rotated.

4,347,759

GEAR CASE

Richard J. Renk, 768 Terrace La., and George E. Boller, 1312 Randall St., both of Winona, Minn. 55987

Filed Aug. 30, 1979, Ser. No. 71,193
Int. Cl.³ F16H *57/02*
U.S. Cl. 74—606 R **12 Claims**



1. A lubricant retaining device for a gear case having a series of sides adapted to contain a lubricant, said case including matable members having edges which abut one another along a split-line to provide an enclosure, said case members having a complimentary pair of side walls with aligned oppositely facing recesses along adjacent edges which form a shaft receiving opening when said sections are assembled together, said case being adapted to enclose at least a pair of interacting gears which give off a lubricant spray pattern when rotating, and wherein a gear in said case has a rim with a tooth area along the periphery thereof and an arm relatively thinner than said rim extending radially inwardly from said rim to provide an undercut area under said tooth area, and wherein a shaft surface extends through said opening and is rotatable with one of said gears with a spray pattern from said gears being directed toward said shaft surface, said device comprising,

section means adapted to extend inwardly from a point adjacent a side of said case and in overhanging relation with respect to at least a portion of said shaft surface as the latter extends through said opening to the interior of said case, said section means being positioned between said shaft surface and said gear tooth area to extend on both sides of said split-line between said gear case members and beyond the lubricant spray pattern from said gears toward shaft surface to deflect lubricant spray directed toward said shaft surface,

said device being split to provide ends and having means provided on said section means to the interior of said case for urging said ends toward one another, and

means carried by said device for locating said section means relative to said case.

4,347,760

LOCKING DIFFERENTIAL CONTROL SYSTEM

Mark D. Jewett, Livonia, Mich., assignor to Massey-Ferguson, Inc., Detroit, Mich.

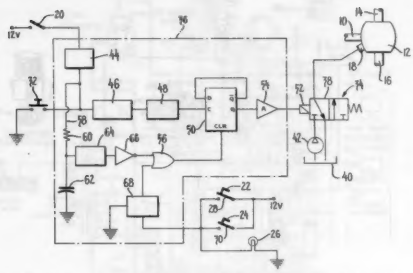
Filed Jan. 25, 1980, Ser. No. 115,469
Int. Cl.³ F16H *1/44*
U.S. Cl. 74—710.5 **13 Claims**

1. A locking differential control system for an operator

controlled vehicle having first and second axle shafts driven through a differential, and locking means capable of selectively locking the differential, the control system being characterized by:

first and second operator controlled signalling means capable of initiating signals in response to actuation by the operator;

a two state device coupled to both the first and the second operator controlled signalling means and capable of alternately switching an output between first and second states



in response to successive actuation signals received from the first operator signalling means, and to switch said output to its first state in response to a signal received from the second operator controlled signalling means; and

an electromechanical transducer operatively interconnected with the locking means and connected to said output of the two state device and capable of causing the differential mechanism to be unlocked when said output is in its first state and to be locked when said output is in its second state.

4,347,761

HYDROMECHANICAL TRANSMISSIONS

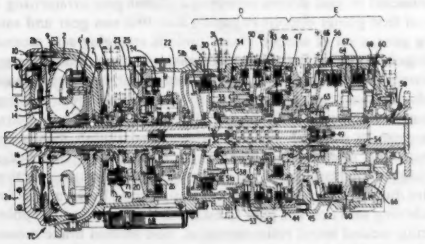
Karl G. Ahlen, Bromma, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden

Filed Aug. 15, 1979, Ser. No. 66,860

Claims priority, application United Kingdom, Aug. 18, 1978, 33809/78; Aug. 24, 1978, 34391/78; Nov. 6, 1978, 43313/78; Nov. 6, 1978, 43315/78; Nov. 21, 1978, 45431/78; Nov. 21, 1978, 45432/78

Int. Cl.³ F16H *47/00*; B60K *41/04*

U.S. Cl. 74—732 **17 Claims**



1. A hydromechanical transmission for driving a vehicle, comprising a torque converter component, a complimentary mechanical gear component, a feeder fluid pump system component, a valve system component and an automatic and a manual control means component, wherein:

(A) the torque converter component comprises at least one pump member, at least one guide member and at least one turbine member with a ring of turbine blades following the pump member, a direct drive lock-up clutch and a friction clutch permitting the guide member to be locked against rotation in at least one direction;

(B) the complimentary mechanical gear component is a servo-motor controlled multiple speed mechanical gear of the power shift type having one planet gear carrier and a plurality of planetary gears providing a plurality of different gear ratios;

(C) the feeder fluid pump system component is servo-motor controlled and includes at least one variable capacity pump unit;

(D) the valve system component includes one disc valve arrangement for controlling the flow of feeder fluid through the converter, with the valves thereof adapted to open and close relatively large port areas upon relatively short movements of the valves and a second disc valve arrangement for controlling the flow of feeder fluid to the complimentary mechanical gear servo-motors with the valves thereof adapted to open and close relatively large port areas upon relatively short movements of the valve; and

(E) the automatic control means component includes a microprocessor for receiving input signals relating to "primary speed", "output shaft speed" and "fuel injection settings" and for processing said signals in accordance with preprogrammed memories and according to manual settings so as to produce output signals to determine operation of the torque converter component and the complimentary mechanical gear component.

4,347,762

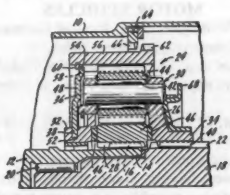
PLANETARY GEAR ASSEMBLY

John W. Holdeman, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 937,342, Aug. 28, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,243

Int. Cl.³ F16H *3/44, 57/10*

U.S. Cl. 74—788 **16 Claims**



1. In combination, first and second rotatable members, and a planetary gear assembly movable as a unit, said planetary gear assembly comprising sun gear means continuously engaged with said first member, planet carrier means continuously engaged with said second member, ring gear means, and planet gear means supported by said planet carrier means in meshing relationship with said sun and ring gear means, said planetary gear assembly being movable to one position wherein said sun gear means is engaged with said second member and said ring gear means is not grounded, and to another position wherein said sun gear means is not engaged with said second member and said ring gear means is grounded.

4,347,763
ONE-WAY BRAKE

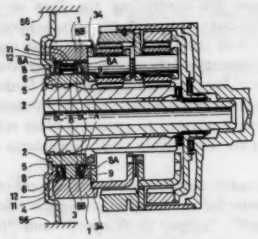
Shiro Sakakibara, Toyokawa; Kazumasa Tsukamoto, Toyota; Takahiro Sakai, Toyota, and Yukio Terakura, Toyota, all of Japan, assignors to Aisin Warner K.K., Anjo, Japan

Filed Jun. 2, 1980, Ser. No. 155,614

Claims priority, application Japan, Sep. 13, 1979, 54-127560[U]

Int. Cl.³ F16H *57/10*; F16D *59/00*

U.S. Cl. 74—789 **5 Claims**



1. A one-way brake comprising a plurality of sprags held by annular cages and annular isolation springs and inserted in an annular space between outer and inner races; end bearings each of which consists of an annular and radially extended support wall, an axially extended outer rib contacting the inner circumferential surface of said outer race, and an inner rib axially extended in the same direction as said outer rib and contacting the outer circumferential surface of said inner race, and each of which is inserted in said annular space; and stopper means consisting of stopper plates connected to said outer race of snap ring fitted into groove provided in the inner circumferential surface of said outer race to thereby hold in said annular space the outer race side portion of the support wall of said end bearings, characterized in that each of said support walls is protruded at the inner race side portion thereof in the outward direction with respect to said annular space from that surface of said support wall which is contacted by said stopper means connected to said outer race, to thereby increase the area of that portion of said inner race which is in sliding contact with said inner rib.

4,347,764
HYDRAULIC CONTROL VALVE SYSTEM FOR A PLANET GEAR TRANSMISSION PARTICULARLY FOR MOTOR VEHICLES

Walter Lauven, Wohnpark, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

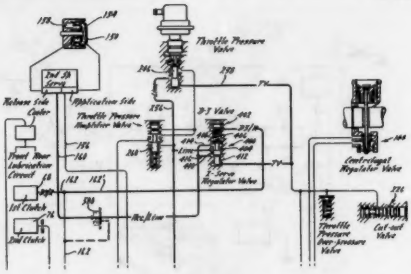
Filed Sep. 14, 1979, Ser. No. 75,455

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841507

Int. Cl.³ B60K *41/04*; F16H *3/74*

U.S. Cl. 74—867 **4 Claims**

1. In a hydraulic control valve system for a multiple-ratio, geared transmission having plural torque delivery paths extending from a driving member to a driven member, said paths being defined by planetary gear elements, clutch and brake means for controlling the relative motion of the gear elements to establish each of several torque ratios in the gearing, said clutch and brake means including a double acting intermediate speed ratio brake and a high speed ratio clutch, said brake being adapted to anchor one element of the gearing to establish a torque reaction point during an underdrive condition, said clutch being engageable selectively to establish a direct-drive, 1:1 ratio, a pressure source comprising a pump driven by said driving member, a valve circuit including a shift valve in said circuit for controlling distribution of pressure from said pump to said clutch and brake means, said brake means including a double acting servo having a piston engageable with a brake friction member, a double working chamber having a portion situated on either side of said piston, said chambers being simultaneously pressurized to establish a brake release condition, one pressure chamber being exhausted to establish a brake apply condition, and an intermediate ratio servo pressure regulator valve means in said circuit including a first passage communicating with the release side of said intermediate ratio servo and another passage communicating with a high pressure portion of said circuit, a modulator valve means for modulating the pressure in said high pressure portion to produce an accumulator pressure in said first passage, a source of a pressure signal that is proportional in magnitude to the input torque for said gearing, means for distributing said pressure signal to said servo regulator valve to control the modulating valve portions acting thereon whereby an increase in the torque related pressure establishes a decrease in the pressure in said accumulator line whereby the servo capacity for said intermediate ratio brake is proportional to the torque input.



4,347,765
MULTIPLE RATIO OVERDRIVE TRANSMISSION

Allan S. Leonard; Ralph C. Bolz, and Lawrence D. Burcz, all of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

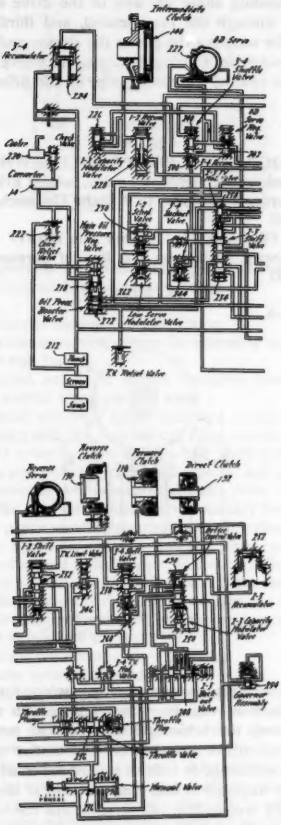
Filed Oct. 5, 1979, Ser. No. 82,399

Int. Cl.³ F16H *47/00*; B60K *41/22*

U.S. Cl. 74—869 **36 Claims**

1. A power transmission mechanism comprising a hydrokinetic torque converter having a bladed turbine and a bladed impeller, a driven member, a driving member connected to said impeller, a planetary gear unit comprising a first sun gear and a second sun gear, the diameter of said first sun gear being larger than the diameter of said second sun gear, a ring gear connected to said driven member, a planet gear comprising a set of first planet pinions engaging said first sun gear and said ring gear, a set of second planet pinions engaging said second sun gear and said first planet pinions, a carrier rotatably supporting said pinions, first clutch means for connecting said turbine to said second sun gear to establish a forward drive, second clutch means for connecting said turbine to said first sun gear to establish reverse drive, third clutch means for connecting said driving member to said carrier, first brake means for anchoring said carrier to establish a torque reaction point during low speed ratio operation, second brake means for anchoring said first sun gear to establish a torque reaction point during second speed ratio operation, said second brake means including a friction brake and an overrunning brake in series relationship, third brake means for anchoring said first sun gear to establish a torque reaction point during overdrive operation, separate fluid pressure operated servos for actuating each of said clutch means and said brake means, a fluid pump, a valve circuit connecting said pump and said servos to actuate and release the servos during ratio changes, said third brake means comprising a double acting piston and a pressure cylinder, said piston and cylinder defining opposed release and apply pressure chambers, shift valve means for controlling pressure dis-

tribution to said third brake means to establish ratio changes between third speed ratio and overdrive ratio, overdrive servo regulator valve means between said shift valve means and said apply pressure chamber for modifying the actuating pressure for said third brake means to effect a smooth ratio transition between said overdrive and third ratios, said overrunning brake accommodating overrunning motion of said first sun



gear as said third clutch means becomes applied, said circuit including a shuttle valve located between said apply chamber and said shift valve means and in communication with a high pressure part of said circuit, said shift valve means being adapted to distribute actuating pressure to said shuttle valve when it assumes an upshift condition, whereby said shuttle valve connects said high pressure part to said apply chamber.

4,347,766

SHARPENER FOR STEEL EDGES OF SKIS

Hans Heinlein, Bahnhofstrasse 11-13, 8502 Zirndorf, Fed. Rep. of Germany

Continuation of Ser. No. 749,521, Dec. 10, 1976, abandoned. This application Mar. 11, 1981, Ser. No. 242,820

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556178; Dec. 7, 1976, 2655342

Int. Cl.³ A63C *11/06*; B27G *17/04*; B21K *17/00*

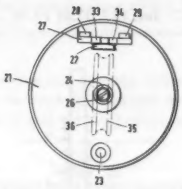
U.S. Cl. 76—83 **23 Claims**

1. A sharpener for steel edges of skis, comprising:

a holder having a substantially flat planar surface for stable sliding contact with a ski surface;

a cutting plate having first and second cutting edges on opposed sides thereof, said plate being disposed on said holder such that said plate and both of said cutting edges thereof protrude from said flat surface; and

guide means disposed on said holder and protruding from said flat surface substantially perpendicular thereto for guiding the edge of a ski disposed on said flat surface, when said ski edge is in contact with both said first cutting edge and one side of said guide means, such that an appropriate cutting angle is maintained at said first cutting edge when the sharpener is moved along the edge of the ski in



a given cutting direction, and also for guiding the edge of a ski disposed on said flat surface, when said ski edge is in contact with both said second cutting edge and the other side of said guide means, such that an appropriate cutting angle is maintained at said second cutting edge when the sharpener is moved along the edge of the ski in a given cutting direction;

wherein said cutting plate and said guide means are so disposed with respect to said flat surface that a sufficient amount of said surface is present on both sides of a line connecting said cutting plate and said guide means to provide stable sliding contact with a ski surface when placed on either side of such line and in contact with both said cutting plate and said guide means.

4,347,767

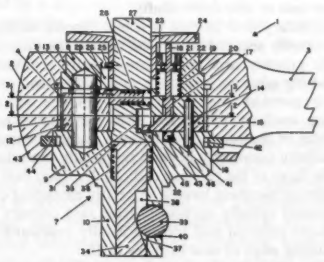
RATCHETING DEVICE

Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y. 12308

Filed Jan. 6, 1981, Ser. No. 222,780

Int. Cl.³ B25B *13/46*

U.S. Cl. 81—62 **8 Claims**



1. A ratcheting device comprising:

a drive member having a toothed bore;

a driven member rotatably mounted within said driver member and including a centrally mounted upper actuating member having a transversely mounted pawl detent;

a double ended toothed pawl pivotally mounted within said driven member and positioned such as to interact with said pawl detent and said toothed bore;

and a push-button actuated direction shifting mechanism

operatively associated with said upper actuating member to provide reversed rotation thereto for effectuating alternate engagement of the toothed ends of said double ended pawl with said toothed bore, upon successive depression of said push-button.

4,347,768

DRILLING TOOL FOR PRODUCING AN UNDERCUT BORE

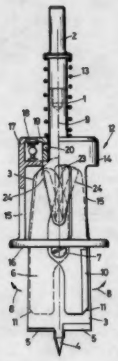
Edgar Boehm, Bremen, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Liechtenstein, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 54,242

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 7820164[U]

Int. Cl.³ B23B *41/06*

U.S. Cl. 82—1.5 **1 Claim**



1. A drilling tool for producing an undercut bore, the tool comprising:

an axially extending rotatable drive shaft;

a primary drill fixedly secured to one end of and extending axially outwardly from said drive shaft, said primary drill comprises a thin flat plate extending in the axial direction with the front end thereof extending radially of the axial direction, said front end forming a radially extending cutting edge extending transversely outwardly from both sides of the axial direction, said primary drill having a pair of opposite faces with each face having a pair of spaced axially extending edges each located on an opposite side of the axis of said drive shaft;

a secondary drill having first and second cutting members pivotally secured to at least one of the opposite faces of the primary drill and located axially rearwardly of said cutting edge such that the first and second cutting members pivot in opposite directions between a retracted position confined within the axially extending edges of the faces of the primary drill and a flared position extending radially outwardly beyond the axially extending edges of the faces of the primary drill, each of said first and second cutting members having an axially extending cutting edge located radially outwardly from said primary drill in the flared position and located axially rearwardly from the cutting edge of said primary drill;

spring means for biasing the secondary drill into the retracted position;

means for overcoming the spring means only after the drill advances axially a predetermined distance, thereby pivoting the secondary drill to its flared position and producing an undercut, the overcoming means comprises a sleeve coaxial with and encircling the drive shaft and axially movable relative to the drive shaft, first and second slots in the cutting members of the secondary drill located within the axially extending range of said sleeve when said secondary drill is in the retracted position, in the retracted position said first and second slots having first ends located closer to the cutting edge of said primary drill and second ends located further away from the cutting edge of said primary drill and said first ends located on the axis of said drill shaft and said second ends spaced radially outwardly from the axis so that said first and second slots are angled symmetrically away from the axis of the drive shaft in the direction away from the cutting edge of said primary drill, a third slot in the primary drill aligned with and extending along the axis of the drive shaft, a pin passing through the first, second, and third slots, and means for securing the pin to the sleeve, and the spring means comprises a spring for urging the sleeve in the axial direction toward the cutting edge of said primary drill.

4,347,769

UNDERFLOOR LATHE FOR PROFILING WHEEL SETS

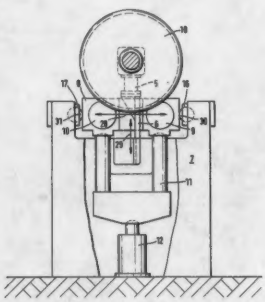
Theodor Dombrowski, and Max Luzina, both of Erkelenz, Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH

Filed Aug. 25, 1980, Ser. No. 180,817

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937751

Int. Cl.³ B23B *5/32*

U.S. Cl. 82—8 **7 Claims**



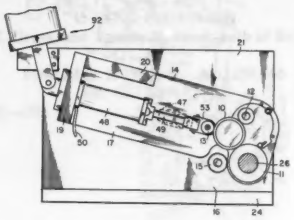
1. In an underfloor wheelset turning machine for the profiling of wheelsets of vehicles which run on rails roll carrier means mounted for horizontal and vertical movement, a spaced pair of rollers mounted on said carrier means, said rollers being positioned to contact at least the tread of a wheel of a wheelset disposed in said machine, and at least partially supporting the weight thereof, drive means connected to at least one said roller for driving said wheel, the improvement which comprises horizontally acting brake means operatively connected to said carrier means for yieldably resisting horizontal movement of said carrier means in a plane perpendicular to the axis of said wheel.

2. An underfloor wheel set turning machine for the profiling of wheel sets of vehicles which run on rails comprising roll carrier means mounted for horizontal and vertical movement, said roll carrier means including oppositely directed vertical guide surfaces, a spaced pair of rollers mounted on said carrier means, said rollers being positioned to contact at least the tread of a wheel set disposed in said machine, and at least partially supporting the weight thereof, drive means connected to at least one said roller for driving said wheel, and horizontally acting brake means operatively connected to said carrier means for resisting horizontal movement of said carrier means in a plane perpendicular to the axis of said wheel, said brake means comprising horizontally aligned first and second brake assemblies, each said assembly including a guide roll rotatable about a horizontal axis and engaging one of said guide surfaces.

4,347,770
APPARATUS AND METHOD FOR RADIALLY CUTTING CYLINDRICAL MATERIAL

Charles G. Mosey, 319 Henley Rd. South; George N. Mosey, 1912 Morrow Rd.; Charles J. Mosey, 308 S. 21st St., and Stephen A. Mosey, Boston Township Line Rd., all of Richmond, Ind. 47374

Filed Mar. 3, 1980, Ser. No. 126,949
Int. Cl.³ B23B *5/14*
U.S. Cl. 82—90 **8 Claims**



8. An apparatus for radially cutting material having an exterior cylindrical surface which comprises:

a frame;

a roller carrier mounted to said frame;

roller carrier mounting means for mounting said roller carrier to said frame;

first, second and third rollers rotatably mounted to said roller carrier about parallel axes;

first, second and third roller mounting means for rotatably mounting said first, second and third rollers, respectively, to said roller carrier, at least said third roller mounting means comprising a hydraulic cylinder and a piston member received within and extendable from the hydraulic cylinder, said third roller being rotatably mounted to one of the piston member and the hydraulic cylinder, the other of the hydraulic cylinder and the piston member being secured to said roller carrier, said third roller being movable to a position to hold a piece of the material against said first and second rollers to engage the material with said first, second and third rollers about greater than 180° of the exterior of the material;

drive means for rotating the material;

saw means mounted to said frame;

saw mounting means for mounting said saw means to said frame; means for rotating said saw means; and

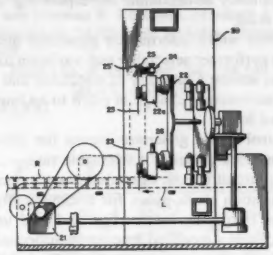
movement means for moving said roller carrier relative to said saw means, with the material simultaneously being held by said first, second and third rollers and being rotated by said drive means, to radially cut the material said roller carrier being pivotally mounted to said frame, said movement means including means for pivoting said roller carrier relative to said frame, said roller carrier being mounted to pivot relative to said frame about the axis of one of said first and second rollers.

4,347,771
APPARATUS FOR SHARPENING A DISC

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Nov. 10, 1980, Ser. No. 205,716
Int. Cl.³ B26D *7/12*
U.S. Cl. 83—174 **10 Claims**

7. Apparatus for cutting comprising a frame, means on said frame for advancing a product along a lineal path for transverse cutting thereof, an arm rotably mounted on said frame and equipped with a cutting disc for movement through an orbit intersecting said path, disc sharpening means on said arm including first and second devices each equipped with grinding stones, one for each side of the disc, each device including bracket means mounted adjacent said disc and projecting generally axially of said disc and adjustably supporting a carriage, a shaft for the grinding stone associated therewith, resilient leaf

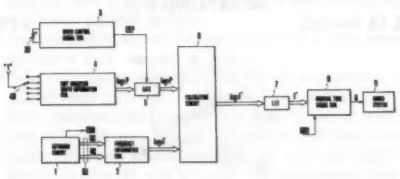


spring means connecting said carriage with said shaft whereby adjustment of said carriage deforms said leaf spring means to adjust the pressure of said grinding stone against said disc.

4,347,772
ELECTRONIC MUSICAL INSTRUMENTS CAPABLE OF VARYING TONE PITCH DURING ONE KEY DEPRESSION

Tetsuo Nishimoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 10, 1980, Ser. No. 205,708
Claims priority, application Japan, Nov. 21, 1979, 54-151082
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **18 Claims**



1. An electronic musical instrument comprising:

keyboard means having a plurality of keys;

a frequency information generator for generating a first frequency information corresponding to a tone pitch designated by a depressed one of said keys;

a pitch variation information generator for generating a pitch variation information representing a discrete pitch step width;

a performer controllable pitch variation designator for enabling arbitrary designation by a performer, from a plurality of designatable values, of the magnitude of said pitch step width represented by said pitch variation information to be generated by said pitch variation generator;

calculating means for generating a second frequency information in accordance with said first frequency information and said pitch variation information, said second frequency information varying stepwisely from a first value to a second value in steps each having the width represented by said pitch variation information;

a musical tone signal generator for generating a musical tone signal having a frequency corresponding to the value of said second frequency information; and

a sound system for converting said musical tone signal into a musical tone.

16. In an electronic musical instrument including a tone generator for generating a musical tone having a pitch established by a certain modified frequency information supplied

thereto, a system for producing glissando, portamento, and like effects, comprising:

note frequency information generator means for producing note frequency information corresponding to a selected musical note;

unit variation width information generator means for providing a performer selectable unit variation data establishing, from among a plurality of selectable unit cent values, a fixed incremental change in pitch to be imparted to the generated tone;

speed control signal generator means for providing pitch variation clock pulses at a selectable rate;

calculating circuit means, operative at each occurrence of a pitch variation clock pulse, for arithmetically combining said note frequency information and said unit variation data to obtain a modified frequency information which is supplied to said tone generator to establish the pitch of the tone generated thereby, said established pitch varying stepwise at a rate established by the selected rate of said pitch variation clock pulses and changing incrementally in pitch by unit values established by the selected unit variation data.

4,347,773

MUSICIAN'S PICK

Steven T. Zook, Long Beach, Calif., assignor to Ronald F. Vaughn, Long Beach, Calif.

Continuation-in-part of Ser. No. 65,859, Aug. 3, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,665

Int. Cl.³ G10D *3/16*

U.S. Cl. 84—322 **4 Claims**

1. A musician's pick comprising:

a gripping portion lying generally within a grip plane and adapted to be gripped between the thumb and forefinger of a musician with said grip plane generally parallel to the longitudinal axis of the musician's forearm;

a pick portion adjacent said gripping portion and lying generally within a pick plane, said pick portion having a predetermined extended length adapted to engage an instrument string at a predetermined depth when said gripping portion is gripped between said thumb and forefinger; and,

an intermediate portion integrally joining said side grip portion and said pick portion such that said pick plane is angularly inclined relative to said grip plane, thereby enabling orientation of said pick plane parallel to the string despite a non-parallel orientation between the longitudinal axis of the musician's forearm and the string, said intermediate portion including a pair of oppositely oriented shoulders which are each characterized by a planar portion to serve as stops for the thumb and forefinger of the musician, said pick having an overall length of approximately one inch, and said intermediate portion being located midway between the opposite ends of said pick.

4,347,774

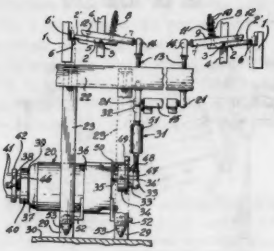
ACTUATOR FOR CAPTURE TYPE COMBINATION SYSTEM IN ORGANS

Irene Roy, 1080 Bordeleau, Ste- Hyacinthe, Quebec, Canada

Filed Jun. 25, 1981, Ser. No. 277,336

Int. Cl.³ G10B *3/10*

U.S. Cl. 84—345 **9 Claims**



1. An actuator for the selector hooks of a capture type combination system in an organ, said selector hooks arranged in at least one row and selectively shiftable laterally of said row between an operation and an inoperating position, a lever board pivotally mounted on a support frame and having a front edge extending parallel with said row and engageable with the selector hook shifted to operating position and clearing those selector hooks remaining in inoperating position, an electric motor, crank means driven by said motor and connected to said lever board to cause reciprocating movement of said lever board with said front edge engaging and longitudinally moving said shifted selector hooks and motor operated switch means to stop said motor after one complete rotation of said crank means.

4,347,775

PLUG FOR MOUTHPIECE OF A WOODEN RECORDER

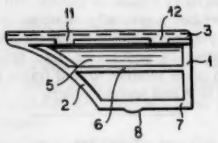
Hans-Dieter Held, and Waldemar Schaller, both of Trossingen, Fed. Rep. of Germany, assignors to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,540

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022822

Int. Cl.³ G10D *7/02*

U.S. Cl. 84—380 C **5 Claims**



1. A plug for a mouthpiece of a wooden recorder, comprising an integrally molded member with a concave front end wall, a flat rear end wall and a plurality of connecting walls between said end walls, said connecting walls including an upper wall adapted to form a boundary for a flue of the mouthpiece upon insertion of the plug into same, said end walls defining sections of an imaginary cylinder,

at least one of said connecting walls other than said upper wall having a portion which extends along the periphery of said imaginary cylinder and is provided with an external hump adapted to contact an adjacent inner wall surfce of the mouthpiece into which the plug has been inserted,

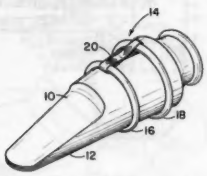
said portion being resiliently inwardly deformable under contact pressure between said hump and the mouthpiece.

4,347,776

O-RING LIGATURE

Kenneth G. Grass, and Tommy R. Stout, both of Broken Arrow, Okla.

Filed May 1, 1981, Ser. No. 259,666
Int. Cl.[3] G10D 9/02
U.S. Cl. 84—383 R 5 Claims



1. A ligature device for holding a reed to a woodwind musical instrument mouthpiece comprising:

(a) a pair of elastomeric rings adapted to sequentially fit over the reed and mouthpiece applying sufficient compressive force to hold said reed in place; and

(b) a means for holding said elastomeric rings at a predetermined fixed distance apart from each other.

5. A method for holding a reed to a woodwind musical instrument mouthpiece comprising the steps of:

(a) sequentially fitting a pair of elastomeric O-rings over the reed and mouthpiece, said O-rings applying sufficient compressive force to hold said reed in place; and

(b) selecting and positioning said pair of O-rings at a predetermined fixed distance apart from each other according to the following table:

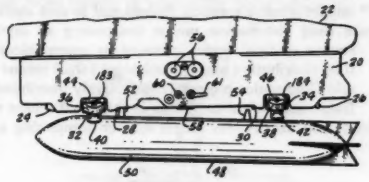
Instrument (Tradename of Hard Rubber Mouthpiece)	Front O-Ring Diameter	Back O-Ring Diameter	Fixed Distance
Soprano Sax	¾"	13/16"	¼"
Tenor Sax (Runyon)	13/16"	¾"	1"
Alto Sax (Selmer HS* Vandoren 77,88 99)	15/16"	1"	1"
Tenor Sax (Vandoren 77,88,99)	15/16"	1"	1¼"
Tenor Sax (Selmer CS80)	1"	1 1/64"	1¼"
E♭ Bari Sax (Bilhurt 5*, Selmer Bundy[3])	1"	1 1/64	1¼"
Soprano Clarinet (Selmer HS*, Vandoren B45)	15/16"	1"	1"
E♭ & B♭ Contra ¼" Clarinet (Selmer C*)	1 13/16"	1 15/16"	1"
B♭ Bass Clarinet	1¼"	1 3/16"	1¼"

4,347,777

RACK WITH COMPLIANT WEDGE ACTUATED SWAYBRACES

Thaddeus Jakubowski, Jr., Long Beach; Jess W. Lockhart, Torrance, and Norman F. Robinson, Manhattan Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 6, 1980, Ser. No. 194,148
Int. Cl.[3] F41F 5/02
U.S. Cl. 89—1.5 G 11 Claims



1. A store carrier including at least one pair of hooks for retaining a store to said carrier, means to actuate said at least one pair of hooks, and sway brace means positioned to engage the store when retained by said at least one pair of hooks, said sway brace means including:

at least one brace column moveable toward and away from a store retained by said at least one pair of hooks;

means for engagement with a store retained by said at least one pair of hooks connected to said at least one brace column;

at least one longitudinal slot adjacent said at least one brace column, said at least one longitudinal slot having upper and lower parallel surfaces;

at least one ramp surface facing away from a store retained by said at least one pair of hooks;

at least one wedge positioned for sliding engagement with said at least one ramp surface to force said at least one brace column toward a store retained by said at least one pair of hooks, said at least one wedge including parallel upper and lower surfaces which mate with said upper and lower surfaces of said at least one longitudinal slot for sliding contact therewith;

first bias means connected between said at least one wedge and said store carrier tending to force said at least one wedge to positions to force said at least one brace column toward a store retained by said at least one pair of hooks; and

second bias means acting in the load path between said store carrier and said means for engagement with a store tending to pre-load said at least one wedge into engagement with said at least one ramp surface whereby said means for engagement are forced into engagement to brace a store retained by said at least one pair of hooks against lateral sway about said at least one pair of hooks and maintain said engagement in a vibratory environment.

4,347,778

REVERSIBLE FLUID UNIT

Jerome L. Murray, 652 First Ave., New York, N.Y. 10016

Filed Aug. 17, 1979, Ser. No. 67,224
Int. Cl.[3] F01L 33/02; F01B 1/06; F04B 1/04
U.S. Cl. 91—180 15 Claims

1. A reversible fluid device comprising

a housing,

a plurality of circumferentially spaced separately sealed diaphragm chambers disposed within said housing,

shaft means rotatably supported with respect to said housing,

a hub means within said housing fixed to said shaft means,

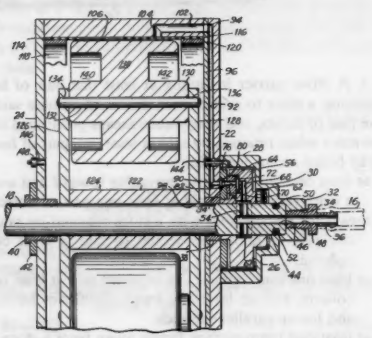
and disposed radially inwardly from said diaphragm chambers,

a plurality of circumferentially spaced roller members rotatably mounted on said hub means disposed for rolling contact with said diaphragm chambers,

fluid communication means operatively associated with each said diaphragm chamber and fluid distribution means to sequentially supply fluid under pressure to selected ones of said fluid communication means thereby to selectively expand selected ones of said diaphragm housings radially inwardly to bear against a contiguous roller member to impart relative rotation thereto and to said shaft means,

said fluid distribution means comprising an inlet from a source of fluid under pressure in communication with fluid distribution means fixed to said shaft means whereby said fluid under pressure is selectively distributed to said fluid communication means as said shaft means rotates,

said fluid distribution means further comprising a housing



fixed to said shaft means including fluid passage means communicating from said inlet from a source of fluid under pressure to a plurality of circumferentially spaced fluid access ports in an end face of said housing,

control means interposed between said fluid distribution means and said fluid communication means to control the flow of fluid under pressure from said fluid distribution means to said fluid communication means, and

said fluid communication means further comprising a plurality of circumferentially spaced fluid access ports in a circular array disposed through an end face of said housing with each said fluid access port communicating with a radially disposed fluid access channel in said end face of said housing to each said diaphragm chamber and wherein said control means comprises a plate member having a plurality of circumferentially spaced fluid access ports therethrough in circular array arranged to be selectively registrable with said fluid access ports in said end face of said housing.

4,347,779

VACUUM BRAKE BOOSTER

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 141,830

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918912

Int. Cl.³ F15B *13/16*; F01B *19/00*; F16J *3/02*

U.S. Cl. 91—369 A **25 Claims**

1. A vacuum brake booster comprising:

a housing having a longitudinal axis and two end walls transverse to said axis;

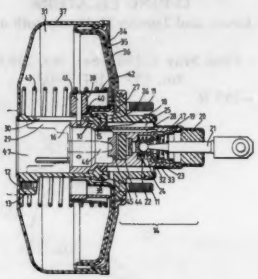
a tube disposed in said housing coaxial of said axis connected between said two end walls;

a movable wall disposed in said housing coaxial of said axis to divide said housing into a vacuum chamber and a working chamber;

a valve housing disposed within said tube containing therein a valve to control the pressure in said working chamber to generate a force proportional to the differential pressure in said vacuum and working chambers to act on said movable wall;

slots through the outer surface of said tube disposed in said vacuum chamber;

cross members extending through and guided in said slots to



interconnect said valve housing and said movable wall on the vacuum side of said movable wall; and

said movable wall includes a diaphragm plate, a first rolling diaphragm disposed on one surface of said diaphragm plate disposed in said working chamber to provide a seal between said movable wall and said tube and at least one component disposed between said one surface and said first rolling diaphragm, said one component exerting an inwardly directed force on said first rolling diaphragm to cover said slots in a positively sealed relationship when said movable wall is displaced in an operative direction.

4,347,780

OPERATING VALVE ASSEMBLY FOR A POWER STEERING

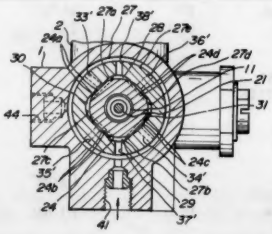
Koichi Takahashi, Yokohama; Megumu Higuchi, and Minoru Watanabe, both of Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 15, 1980, Ser. No. 121,897

Claims priority, application Japan, Feb. 19, 1979, 54-17167

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—375 A **2 Claims**



1. In an operating valve assembly in fluid connection with a pair of power cylinder chambers, a pump and a drain, said valve assembly having an outer sleeve and an inner sleeve in sliding contact with each other, said sleeves being relatively rotatable in response to the twisting of a torsion bar occasioned by a steering load, said outer sleeve having an inner circumferential surface with a plurality of circumferentially spaced apart recesses, said recesses being alternately connected to pump and

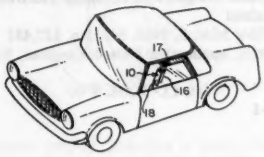
drain chambers which are in turn adapted to be connected respectively to said pump and drain, said inner sleeve having an outer circumferential surface with grooves therein which establish a fluid communication between adjacent ones of said recesses, said outer sleeve further being provided with apertures each normally opening into one of said grooves and being alternately connected to one or the other of said power cylinder chambers, the improvement comprising said recesses being spherical, said grooves extending in directions substantially at right angles to the axis of said inner sleeve, and the bottom surfaces of said grooves being convex.

4,347,781

AIR DEFLECTOR FOR MOTOR VEHICLE WINDOWS

Aarno A. Hassell, 98 Moulton Rd., Storrs, Conn. 06268

Filed Jul. 10, 1979, Ser. No. 56,332
Int. Cl.³ B60J *1/20*
U.S. Cl. 98—2.12 **5 Claims**



1. An air deflector for a motor vehicle window comprising:
deflector means, said deflector means consisting of a flat plate, said flat plate having oppositely disposed first and second ends, said second end of said flat plate extending outwardly from the side of a motor vehicle window when said deflector means is installed;
means for releasably securing said deflector means flat plate to a window, said securing means being generally U-shaped and having first and second ends, said second end of said securing means being joined to and integral with said first end of said deflector means flat plate whereby said flat plate and said securing means formed legs of a generally V-shaped body, said securing means having an elongated slot, said elongated slot being adapted to receive the front edge of a window, said elongated slot being defined by two elongated plates, said elongated plates converging from said second end towards said first end of said securing means, said slot extending at an angle of about 105° to about 135° with respect to said deflector means flat plate; and
support strut means extending between said deflector plate means and one of said securing means elongated plates.

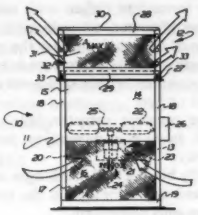
4,347,782

TELESCOPABLE WINTER/SUMMER AIR RECIRCULATOR

David A. Hoecke, Berea, Ohio, assignor to Enercon Systems, Incorporated, Cleveland, Ohio

Filed Nov. 13, 1979, Ser. No. 93,595
Int. Cl.³ F24F *13/10*
U.S. Cl. 98—33 A **2 Claims**

1. An air recirculator to be placed on the floor of a building for recirculating air therewithin at any time of the year, said air recirculator comprising:
(A) a unitary vertical duct-like housing having
(i) air-impermeable side walls extending downwardly for about one half said housing's height,
(ii) air-permeable side walls extending downwardly for the remaining portion of said housing's height, terminating in a base, and
(iii) a fan assembly disposed within said air-impermeable walls with the longitudinal axis of the fan longitudinally axially disposed therewithin to blow air vertically upwards, and
(B) a telescopable outlet hood having
(i) air-permeable side walls which telescopes adjustable over said air-impermeable walls of said housing,
(ii) an air-impermeable end plate to serve as a movable deflector,
(a) which is locatable, when said outlet hood is fully extended as in a winter mode of operation, to deflect air from outlets in said outlet hood upwardly and



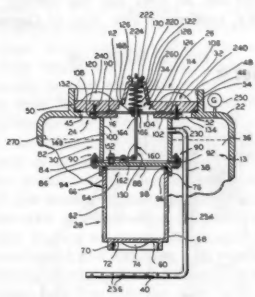
outwardly at an angle in the range from about 30° to about 60° from the horizontal, at a winter air velocity in the range from about 6 to about 12 ft/sec
(b) which is locatable, with said outlet hood in a partially retracted position as in a summer mode of operation, to deflect air from outlets in said outlet hood outwardly and substantially horizontally slightly above persons standing on said floor, and,
(c) which is locatable with said outlet hood in a fully retracted position, as when the device is to be shipped, to a vertical overall height of less than 8 ft.

4,347,783

BEVERAGE CARBONATOR DEVICE

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Filed Apr. 6, 1981, Ser. No. 251,476
Int. Cl.³ B01F *3/04*
U.S. Cl. 99—323.1 **8 Claims**



1. A beverage carbonator device comprising:
an outer container open at its upper end and defining a beverage carbonation chamber and including means for selectively dispensing a carbonated beverage, when contained therein, therefrom,
and a carbonation generation and pressure regulating assembly adapted to be mounted in said chamber and comprising:
a lower generator tank that is open at its upper end and is adapted to receive and contain carbonating gas generating substances,
a carbonating gas receiver including means at its lower end

for removably securing said tank upper end thereto in sealed relation therewith,
said receiver defining an imperforate floor that spans said tank upper end, with said floor defining an orifice opening,
said receiver having an open upper end that is spanned by a flexible diaphragm in sealed relation thereto,
said receiver defining between said floor and said diaphragm a pressure cavity adapted to receive carbonating gas from said tank through said orifice,
a cover secured to said receiver upper end in sealed relation to said diaphragm,
said cover being formed to define with said diaphragm a vented breathing chamber, whereby said diaphragm deflects upwardly of said cavity under the pressure of carbonating gas received in said pressure cavity,
a valve member mounted within said receiver for opening and closing said orifice,
an elongate valve member actuator link secured to said diaphragm and having a depending portion disposed within said cavity,
means for resiliently biasing said diaphragm inwardly of said cavity and toward said floor against the action of said gas in said cavity on said diaphragm,
a gas conduit connected to said receiver in communication with said pressure cavity at one end thereof and extending exteriorly of said assembly and having the other end of same disposed below the level of said tank and formed for emitting gas into the beverage,
means for securing said assembly to said container in sealed relation with said container with said tank and gas conduit other end disposed in the beverage to be carbonated,
and means for articulating said link depending portion to said valve member for positioning said valve member relative to said orifice under the control of said diaphragm for maintaining the carbonating gas in said container at a substantially uniform predetermined pressure.

4,347,784

BEARINGS FOR CALENDER ROLLS AND SUPPORTS THEREFOR

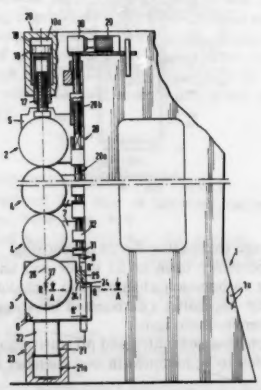
Josef Pav; Gerhard Hartwich, both of Krefeld, and Jörg Prey, Tönisvorst, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Jan. 30, 1981, Ser. No. 230,022

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004914

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—162 R **11 Claims**



1. In a calender, the combination of a stand having elongated guide means; a roll train mounted in said stand and having an outermost roll; bearing means for said outermost roll, said guide means and said bearing means having cooperating surfaces enabling said bearing means to slide along said guide means; stop means provided on said stand; and motor means operable to move said bearing means along said guide means in a direction to advance said outermost roll against the neighboring roll of said train and to engage said bearing means with said stop means, said motor means including a reciprocable component having an axis disposed in a predetermined plane and said stop means being disposed only at one side of said plane.

4,347,785

ENGRAVING PRINTING CYLINDERS

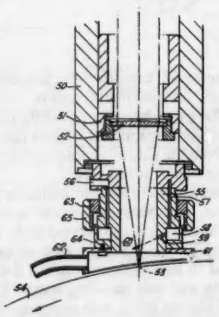
Bryan B. Chase, Layer-de-la-Haye, and Alberto Yi, London, both of England, assignors to Crosfield Electronics Limited, London, England

Filed Mar. 5, 1980, Ser. No. 127,431

Claims priority, application United Kingdom, Mar. 7, 1979, 7908041

Int. Cl.³ B23K *9/00*

U.S. Cl. 101—1 **5 Claims**

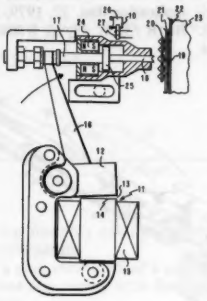


1. Apparatus for engraving a cylinder by means of a laser, comprising:
means for rotating the cylinder to be engraved;
a lens mounted for focusing the laser beam substantially at the cylinder surface;
a structure through which the beam emerges and which terminates in a chamber having one face open towards the rotating cylinder, the said structure including tubular means extending around the beam, the said chamber being shallow, in the direction of the laser beam, and wider than the tubular means, and having a lateral wall which extends around the beam but is spaced from the beam, the chamber being mounted to provide clearance between the cylinder and the edge of the lateral wall defining the open face;
and means defining a path spaced from the cylindrical surface, for a flow of air between the lens and the cylinder, the said air path defining means comprising an air channel, for connection to an air supply, passing through the wall of the tubular structure and having an exit arranged to direct air into the shallow chamber along a path which crosses the optical axis of the lens obliquely in a direction away from the lens axis and is spaced from the point of incidence of the beam on the cylindrical surface, and suction means communicating with the said chamber for extracting air from the region between the lens and the cylinder.

4,347,786
IMPACT PRINTER HAMMER FLIGHT TIME AND VELOCITY SENSING MEANS

Robert H. Sweat, Jr., Round Rock, and William J. Thornhill, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,890
Int. Cl.³ B41J 7/92
U.S. Cl. 101—93.03 **10 Claims**



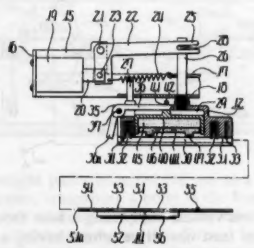
1. In an impact printer including a print wheel having a plurality of selectable character type bearing elements for respectively printing a plurality of characters, said print wheel being rotatable for selectively positioning selected type elements at successive print positions, impact means impellable against said selected elements to drive said elements against a printing medium and means for impelling said impact means against said selected type element, the improvement comprising:

means for detecting the coincident engagement of said impact means with a type element by sensing the velocity of said impact means after said impact means has reached a predetermined coincident engagement position.

4,347,787
PRODUCT NAME STAMPING DEVICE OF LABEL PRINTERS

Yukihiro Takada, Shizuoka; Kimikazu Sugiyama, Shimokanuki Nishimura, and Mithuo Imai, Shizuoka, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1980, Ser. No. 177,912
Claims priority, application Japan, Aug. 14, 1979, 54-103467
Int. Cl.³ B41D 7/00
U.S. Cl. 101—333 **3 Claims**



1. A product name stamping device of label printers comprising:

a reciprocable stamp holder;

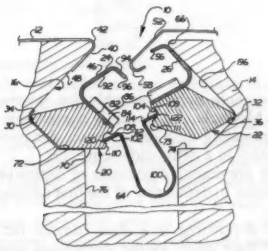
an ink-soaked member contained in the holder and made of spongy material that retains ink therein, the ink-soaked member having a plurality of projections on a first side thereof; and

a stamp insertable in or removable from the holder, wherein the stamp further comprises a base plate of hard material having a plurality of holes formed therein into which the projections of the ink-soaked member fit and an ink-soaking member formed with a stamping portion on which a product name is stamped wherein said projections can contact said ink soaking member to transmit ink from said ink soaked member to said ink soaking member.

4,347,788
PLATE LOCKUP MECHANISM

Charles H. Dufour, Westerly, R.I.; W. Robert Gelinas, Jewett City, Conn.; Michael J. Stankosky, North Stonington, Conn., and Bohdan D. Washchynsky, Pawcatuck, Conn., assignors to Harris Corporation, Melbourne, Fla.

Filed May 1, 1980, Ser. No. 145,438
Int. Cl.³ B41F 27/12
U.S. Cl. 101—415.1 **12 Claims**



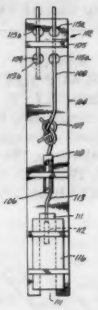
1. A plate lockup mechanism for use in a printing cylinder to secure a printing plate thereto, said mechanism comprising first and second movable members disposed on the printing cylinder, means associated with said first movable member for engaging one end portion of a printing plate, means associated with said second movable member for engaging a second end portion of the printing plate, pivot means enabling said first movable member to rotate between two extreme positions about a first axis generally parallel with the one end portion of the printing plate, pivot means enabling said second movable member to rotate between two extreme positions about a second axis generally parallel with the second end portion of the printing plate, said first and second axes of rotation of said movable members defining a plane, and biasing means engaging said first and second movable members and urging them away from each other, said movable members being movable between a first position in which said biasing means applies a torque to said first member tending to rotate said first member about said first axis in a first direction and a torque to said second member tending to rotate said second member about said second axis in said first direction, and a second position in which said biasing means applies a torque to said first member tending to rotate said first member about said first axis in a second direction and a torque to said second member tending to rotate said second member about said second axis in said second direction, and wherein when said movable members are in either of said first and second positions the line of action of the force applied by said biasing means intersects said plane defined by said first and second axes of rotation of said movable members between said axes of rotation of said movable members, said movable members being further movable to a third position in which the line of action of said biasing means is free of intersection with said plane between said first and second axes to thereby apply a torque to said first member tending to rotate said first member about said first axis in said second direction and a torque to said second member about said second axis in said first direction.

4,347,789

DOWNHOLE DELAY ASSEMBLY FOR BLASTING WITH SERIES DELAY

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 15, 1980, Ser. No. 169,025
Int. Cl.[3] C06C *5/04*
U.S. Cl. 102—275.3 39 Claims



1. A downhole delay assembly for detonating explosive placed in a blasthole, the assembly comprising:

a first detonating time delay device for introducing a first time delay in a detonation sequence;

means for preventing detonation of explosive in a blasthole in response to detonation of the first detonating time delay device;

a second detonating time delay device for introducing a second time delay in the detonation sequence and for initiating explosive in the blasthole;

means for connecting the first time delay device to the second time delay device for initiating the second time delay device in response to the detonation of the first time delay device; and

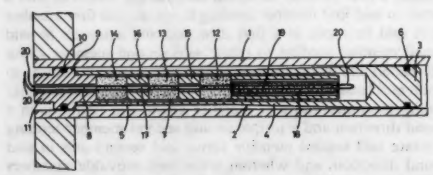
support means for supporting the first and second time delay devices for placement in a blasthole.

4,347,790

EXPLOSIVE PLUG FOR BLOCKING TUBES

Christian E. Lizen, Vencimont, Belgium, assignor to Cockerill and Centre de Technologies Nouvelles, Seraing and Liege, Belgium

Filed Jul. 8, 1980, Ser. No. 166,961
Claims priority, application Belgium, Jul. 11, 1979, 0/196251
Int. Cl.[3] F42D *3/00*
U.S. Cl. 102—304 7 Claims



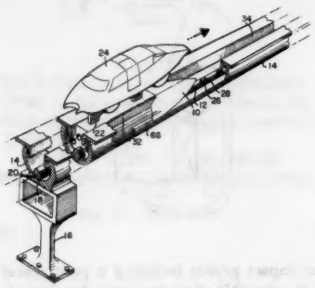
1. An explosive plug for blocking a tube, comprising a tubular metal body closed at one end by a solid head and having at the other end a cylindrical surface-contact region, said tubular metal body being such that when it is placed in a tube to be blocked the surface-contact region is coaxial with but at a distance from the tube, said surface-contact region containing a plurality of explosive charges and a detonator disposed in a tube made of a synthetic material which extends coaxially within the metal body, the adjacent explosive charges being axially separated by a ring of a synthetic material such that the charges can be primed one after another by the detonator, there being an axial passage extending along the entire length of the synthetic tube to accommodate wires for firing the detonator.

4,347,791

VEHICLE GUIDEWAY SYSTEM

James A. Mandros, 60 Newcastle Rd., Peabody, Mass. 01960

Continuation-in-part of Ser. No. 785,455, Apr. 7, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,196
Int. Cl.[3] B61B *13/08, 13/10;* B60V *3/04*
U.S. Cl. 104—156 23 Claims



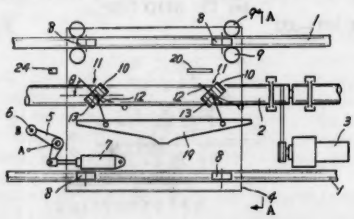
1. A guideway system for cargo including vehicles comprising a carriage mounted to glide in a channel, said carriage having support means to hold said cargo thereon, said carriage having at least one longitudinal recess therein adjacent said channel, said channel having a plurality of vacuum intake ports and gas inlet pressure ports therein in sequence along the path of said carriage, which ports align with said recess as it passes by and means to activate said ports so that compressed gas and suction are applied separately to said recess to propel the carriage along said channel.

4,347,792

DRIVELESS VEHICLE WITH SPEED CONTROL CAM

Katsuhiro Nagahori, Chiba, Japan, assignor to SI Handling Systems, Inc., Easton, Pa.

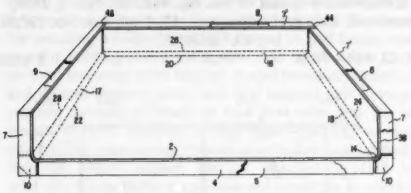
Filed Dec. 18, 1980, Ser. No. 217,862
Claims priority, application Japan, Jan. 11, 1980, 55-1655[U]
Int. Cl.[3] B61B *13/12*
U.S. Cl. 104—166 4 Claims



1. A driverless vehicle comprising a base mounted on support wheels, at least one drive wheel having a support and oscillatable therewith about the axis of its support between a drive position and an accumulation position, a cam supported on the base by a horizontal parallelogram linkage, one leg of which is connected to said support for moving said drive wheel support and said drive wheel between said positions, said cam having a generally longitudinally extending acceleration and deceleration surface positioned so that said surfaces

may contact a cam follower and as a result of such contact move transversely of the base.

4,347,793
COUNTER TOP AND CONSTRUCTION
Edward Rajnert, Box 325, Pine Island, N.Y. 10969
Filed Oct. 15, 1980, Ser. No. 197,131
Int. Cl.³ A47B *13/08*
U.S. Cl. 108—27 11 Claims



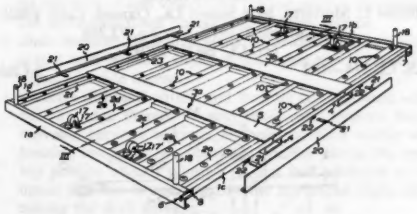
8. A counter top assembly having at least one inside corner comprising in combination:

a base having a plan view form of a particular configuration having at least one corner with first and second adjacent straight edges;

backsplash strips substantially perpendicular to and above said base and in spaced parallelism with respective said first and second adjacent straight edges;

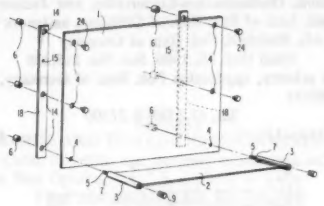
a sheet of synthetic thermoplastic material bonded to said base and said backsplash strips and curved throughout the areas which span the spaces between each said first and second adjacent straight edges of said base and the corresponding said backsplash strips, the sheet being arcuately cut along a line from said one corner of said base so as to provide a convex edge for the sheet portion curved and overlying one backsplash strip which intersects and abuts the surface of the sheet portion curved and overlying the other backsplash strip to form an inside corner juncture.

4,347,794
PALLET FOR USE AS A LOAD-CARRYING SUPPORT
Claes Nordström, Sigvard Grubbesgatan 12, S-230 40 Bara, Sweden
Filed Jul. 15, 1980, Ser. No. 169,080
Claims priority, application Sweden, Jul. 19, 1979, 7906201
Int. Cl.³ B65D *19/28, 19/44*
U.S. Cl. 108—51.1 10 Claims



1. A lightweight pallet intended for use as a load-carrying support for goods, comprising a body in the form of a rectangular framework of beams of light metal interconnected by welding, and a load-carrying surface formed by roller means which comprise a plurality of ball roller means mounted in the framework to rollingly support the goods, wherein said roller means also comprise at least one brake roller means mounted in the framework for braking engagement with goods supported on the balls of said ball roller means, said pallet further comprising means permitting relative movement of said ball roller means and said brake roller means to permit non-braked movement of said goods in either of at least two opposite directions.

4,347,795
SET OF SHELVES
Pekka Mäkinen, Kankaantaka, 37100 Nokia, Finland
Filed Nov. 5, 1979, Ser. No. 91,024
Claims priority, application Finland, Nov. 6, 1978, 783374; Jul. 17, 1979, 792230
Int. Cl.³ A47B *5/00*
U.S. Cl. 108—152 11 Claims



1. A shelf assembly comprising:

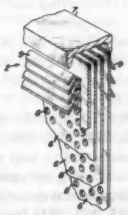
a substantially rectangular-shaped rear plate having at least two spaced openings extending therethrough;

at least one pair of rod-shaped support devices, each having a first end portion extending through a separate opening in said rear plate, each rod-shaped support device including a hollow interior portion and a cleft portion extending outwardly from said interior portion through an exterior wall of said respective support device, with said rod-shaped support devices being positioned such that said respective cleft portions substantially confront one another;

a rigid shelf having an end portion extending into each cleft portion whereby said shelf extends outwardly from said rear plate; and

plug means mounted on each rod-shaped support device for preventing withdrawal of said shelf from said respective cleft portions.

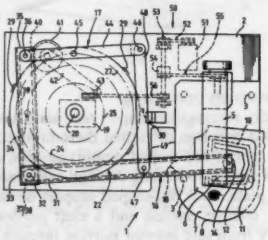
4,347,796
BLAST SUPPRESSIVE SHIELDING
Paul V. King, Joppatowne; Albert P. Becher, Fallston, and Wilmer P. Henderson, Bel Air, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 699,738, Jun. 24, 1976, abandoned, which is a continuation of Ser. No. 495,177, Aug. 6, 1974, abandoned. This application Oct. 5, 1979, Ser. No. 82,263
Int. Cl.³ F41H *5/06*
U.S. Cl. 109—49.5 18 Claims

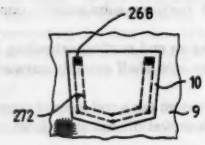


1. A blast suppressive shield comprising a multi-plate metal or metal-like composite which includes in combination:

a first apertured plate in the form of a louvered plate suitable for slowing or confining blast debris and fragments;
a second apertured plate in the form of a perforated plate defining a plurality of gas flow apertures suitable for attenuating blast overpressure; and
means for mounting said first and second apertured plates in spaced apart and substantially fixed position relative to each other.

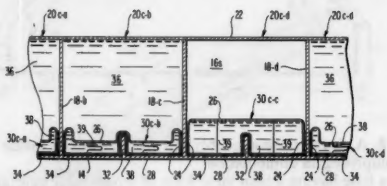
4,347,797
SEWING DEVICE FOR PRODUCING FASTENING STITCHES AND TACK STITCHES
Hans Scholl, Oerlinghausen-Lipperreihe, and Jochen Fischer, Bielefeld, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany
Filed Dec. 10, 1980, Ser. No. 215,238
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1980, 3000831
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **10 Claims**





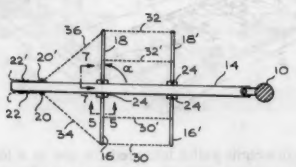
1. A sewing device for producing fastening stitches (270, 272) and tack stitches (268), having
a sewing head (5) including
an arm (57),
a shaft (58) pivoted in said arm (57) and driving a crank mechanism (59),
a needle bar (61) carrying a needle (6) and reciprocately driven by said crank mechanism (59),
a bracket (60) receiving said reciprocating needle bar (61) and pivoted in said arm (57) for allowing a lateral swing movement of said bracket (60) in a plane (63) and
a jogging means (72) imparting said swing movements to said bracket (60), comprising
input drive means (73,191, 219,248) cooperating in an angular relationship with said shaft (58),
an output drive element (92; 226) drivingly connected to said bracket (60).
a mechanism (95,115,188, 189) driven by said drive means (73; 191, 219; 248) for producing oscillating movements transmitted to said output drive element (92;226), said oscillating movements relating to said reciprocating needle movements as 1:1 or 1:2, and
shifting means (105, 237, 251) for selecting one of said two oscillating movements;
means for receiving a workpiece (9, 10) and
control means (17) producing a continuous relative feed movement between said workpiece (9, 10) and said needle (6), comprising
means (25,43,42,41,40,39,38,37,18) as to produce said relative movement in direction of said plane (63) while said sewing head (5) produces said fastening stitches (270, 272).

4,347,798
BUFFER SYSTEM FOR TANKVESSELS
John J. Gallagher, 4206-13th St. NE., Washington, D.C. 20017
Continuation-in-part of Ser. No. 911,528, Jun. 1, 1978, abandoned. This application Nov. 17, 1980, Ser. No. 207,661
Int. Cl.³ B63B *25/08*
U.S. Cl. 114—74 R **5 Claims**



1. In a bulk liquid cargo vessel having plural cargo tanks each having top, side and bottom walls, the system for shielding the liquid cargo carried in said tanks in the event of cargo tank penetration comprising:
top, side and bottom elastomeric walls defining at least one closed buffer tank disposed in each of said cargo tanks to correspond to like walls of said cargo tanks respectively, at least the bottom walls of said buffer tanks being formed and disposed to substantially cover the bottom walls of said cargo tanks;
means sealably fixing at least the bottom walls of said buffer tanks to the bottom walls of said cargo tanks; and
fluid means communicative with each of said buffer tanks to transmit a non-pollutant buffer fluid thereto to selectively displace the top wall thereof to a first position spaced from the bottom wall of the cargo tank in which it is disposed to interpose said non-pollutant buffer fluid at least between said cargo, and the bottom wall of said cargo tanks and shield cargo loaded in said tank at least from penetration of the bottom wall thereof.

4,347,799
SAIL CATCHER
Vincent C. Moriarty, 3474 Sunset La., Oxnard, Calif. 93030
Filed Sep. 4, 1979, Ser. No. 72,354
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—102 **9 Claims**



1. An extendable sail catcher to be mounted on a boom of a sailboat, comprising:
a pair of arms, each of which is positioned on opposite sides of said boom;
hinge means attached to one end of each of said arms and to said boom;

means for pivoting each of said arms outwardly from said boom about said hinge means until each arm defines a predetermined angle with respect to said boom, said means for pivoting comprising first and second securing lines each attached to one of said arms so that said arms will pivot to said predetermined angle when tension is applied to said lines;

stop means for preventing each of said arms from pivoting beyond said predetermined angle;

means for securing said first and second securing lines to said boom whereby said arms will be held against said stop means at said predetermined angle so that said pair of arms and said first and second securing lines define a basket-like structure for catching a sail when it is lowered to said boom; and

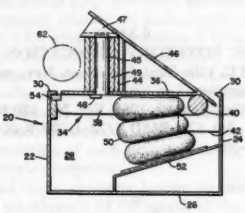
means for holding said arms against said boom when they are pivoted inwardly with respect to said boom comprising first and second magnet pairs, said first magnet pair having one magnet thereof attached to said first arm and the other magnet thereof attached to said boom, said second magnet pair having one magnet thereof attached to said second arm and the other magnet thereof attached to said boom whereby when said arms are pivoted inwardly to said boom, said first pair of magnets are magnetically coupled to each other and said second pair of magnets are magnetically coupled to each other.

4,347,800

RETRACTABLE TOWING PIN

Frederick H. Culver, Covington, La., assignor to Fritz Culver, Inc., Covington, La.

Filed Jan. 21, 1980, Ser. No. 113,954
Int. Cl.³ B63B *21/04*
U.S. Cl. 114—218 **4 Claims**



1. A retractable towing pin assembly adapted to be mounted in pairs on the deck of a marine vessel to guide a tow line therefor comprising:

a housing having an open top portion adapted to be mounted on the deck of said vessel with the top portion disposed in the horizontal plane containing the deck surface;

a shaft member pivotally mounted within and extending across said housing adjacent the open top portion and adjacent a side thereof;

a platform disposed within said housing and mounted adjacent an edge thereof on said shaft, said platform being movable between a lower, inclined position within said housing and an upper, operative position across the open top portion of said housing so that said platform in the upper position is contained in the horizontal plane containing the deck surface;

a cover plate carried by said platform at an edge thereof adjacent said shaft and extending outwardly therefrom, said cover plate being movable with said platform between a lower position wherein said plate closes the open top portion of said housing and is contained in the horizontal plane containing the deck surface and an upper position wherein said plate extends upwardly from said shaft at an acute angle to the horizontal plane;

a roller pin extending between said platform and cover plate and rotatably mounted thereto, said pin being mounted distally to the portions of said platform and plate disposed adjacent said shaft whereby when said platform and cover plate are in the lower position and pin will be contained within said housing, and when said platform and plate are in the upper position said pin will extend upwardly through the deck surface perpendicular to the horizontal plane;

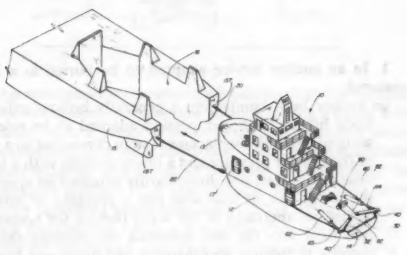
inflatable actuator means mounted underneath said platform for raising and lowering said platform between its upper and lower positions to extend and retract said pin.

4,347,801

BARGE AND TUG CONNECTION SYSTEM

Jean P. Colin, Meta..ie, La., assignor to Bretagne ACB Corporation, New Orleans, La.

Filed Jan. 29, 1980, Ser. No. 116,616
Int. Cl.³ B63B *21/60*
U.S. Cl. 114—248 **35 Claims**



1. A barge and tug connection apparatus comprising:

a. a barge providing a V-notched portion for receiving a tug into said V-notch;

b. a tug for pushing said barge with said notch allowing said tug to pitch and heave in said notch relative to said barge;

c. a least one elongated elastic pushing line, said pushing line terminating at barge and tug end portions which define its length, said pushing line stretching during operation responsive to relative movement between said tug and said barge;

d. tug connection means associated with said tug and separate from said pushing line for connecting the tug end portion of said pushing line to said tug, said pushing line being disposed during operation between said barge and said tug connection means, said tug connection means comprising at least in part moving means movably mounted on said tug between aft connected and fore disconnected positions, for forming a connection with the tug end portion of said pushing line, said moving means being generally aft of said disconnected position when in said connected position;

f. release means for separating said pushing line from said moving means responsive to movement of said moving means from said aft connected position to said fore disconnected position;

g. pre-stressing means associated with said connection means for pre-stressing said pushing line uniformly along its length between said barge and said tug connection means, with said pushing line being stressed continuously during operation by said pre-stressing means disallowing a slackening of said pushing line.

4,347,802

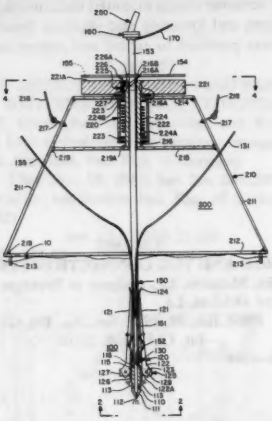
SELF-BURYING ANCHOR SYSTEM

William R. Hossfeld, 3 Pine Ct., Kentfield, Calif. 94904

Filed May 19, 1980, Ser. No. 150,925

Int. Cl.³ B63B *21/26*

U.S. Cl. 114—295 **10 Claims**



1. In an anchor device adapted to be buried in a bed of material;

an anchor head comprising a generally hollow cylindrical body having an upper portion adapted to be releasably secured to a hollow placement stem connected to a supply of fluid under pressure and a lower portion with a tapered nose and at least one downwardly oriented jet aperture in the lower end of said nose and a plurality of upwardly angled jet apertures in the walls thereof for transmitting said fluid into the bed materials surrounding said nose thereby to fluidize said material and drive said head into said bed;

a fin assembly mounted on said anchor head intermediate said top and bottom portions thereof and comprising a plurality of fins and means for mounting a foot portion of each of said fins for rotation of said fins between a folded position generally parallel to the axis of said anchor head and an unfolded position at a substantial acute angle to said axis; and

an anchor line assembly including an anchor line and means fastening said anchor line to said fin assembly to enable said anchor head and fin assembly to be partly retracted from said bed to unfold said fins and thereby set said anchor device in said bed;

said placement stem including a transversely extending stop plate fastened thereto at a preselected distance from said anchor head to determine a maximum burying depth for said anchor device.

4,347,803

DISPLAY DEVICE PROVIDING MAGNIFIED INDICATION

Masaharu Ohba, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 13, 1980, Ser. No. 177,584

Claims priority, application Japan, Oct. 26, 1979, 54-149092[U]

Int. Cl.³ G09F *9/00*

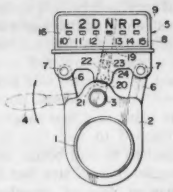
U.S. Cl. 116—28.1 **8 Claims**

1. A display device for displaying an indication of a quantity, comprising:

an indicator member rotatable within a first range of rotational movement around a first axis; and

a drive member rotatable around a second axis, different from and substantially parallel to said first axis, within a second range of rotational movement, through an angle corresponding to said quantity, said drive member engaging said indicator member so as to drive said indicator member around said first axis;

a point of engagement between said drive member and said indicator member describing a locus, with said first and second axes being located on the same side of said locus, as



said drive member and said indicator member move through their respective ranges of rotation, the perpendicular distance from any point on said locus to said first axis being shorter than the perpendicular distance from said point to said second axis;

said indicating member having a portion for displaying the indication of said quantity located at a side of said point of engagement remote from said first axis.

4,347,804

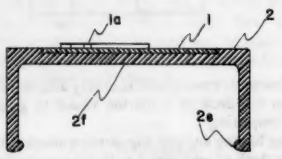
MONO-DISC ROTATORY MEDICATION REMINDER

Antony-Euclid C. Villa-Real, Las Vegas, Nev., assignor to Medi-Timer Corporation, Las Vegas, Nev.

Filed Feb. 12, 1980, Ser. No. 120,865

Int. Cl.³ B65D *5/72*; G09F *9/00*

U.S. Cl. 116—308 **1 Claim**



1. A medication dosage time-intake reminder device for a medicine container comprising:

a stationary portion having a lower disc-like central surface, an upper and outer ring-like surface, and a ridge and groove portion between said surfaces, said upper and outer ring-like surface having time indicia thereon;

an inner annular disc member having an annual ridge means for engagement with said ridge and groove portion between said surfaces, said disc member rotatable within said ridge and groove portion and within said disc-like central surface and the top surface of said disc member flush with said upper ring-like surface;

medication dosage indicating means on said disc member whereby upon rotation of said disc member with respect to the stationary portion, the medication dosage indicating means may be aligned with the time indicating means to indicate the time for the next dose administration; and

an annular protuberance on said depending annular wall for engaging a medicine container whereby said device may be firmly attached to said medicine container cap.

4,347,805

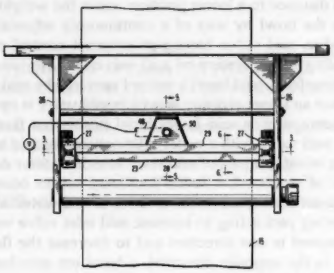
APPARATUS FOR LIQUID COATING THICKNESS CONTROL

Robert T. Ernest, Portage, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 685,801, May 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 540,599, Jan. 13, 1975, abandoned. This application Jan. 30, 1980, Ser. No. 116,877

Int. Cl.[3] B05C *11/06*

U.S. Cl. 118—63 13 Claims



1. In combination with a pair of opposed nozzles, a bath of liquid coating which will harden to form a solid coating on a substrate, means for moving a continuous imperforate web lengthwise through the bath of liquid coating, the web issuing from the bath having excess liquid coating thereon and means for moving the coated strip upwardly between the nozzles in such closely spaced relation to each nozzle as to make the nozzle operative for impinging a stream of fluid under pressure against the web for removing excess liquid coating from the web and wherein the two opposed streams of fluid under pressure normally cause a heavier liquid coating to remain on the longitudinal marginal portions of the imperforate web after the web has passed the nozzles, the improvement for preventing the accumulation of such heavier coating on the web in which each nozzle comprises

an elongated body member having its length dimension disposed transversely of the length of the web,

an elongated plenum chamber enclosed by the body member and extending along the length thereof,

fluid discharge orifice forming means facing toward the web and extending along the length of the body member for placing the plenum chamber in communication with the exterior of the body member,

fluid inlet port forming means associated with the body member in fluid communication with the plenum chamber in only an intermediate zone along the length of the plenum chamber, the fluid inlet port forming means constituting the only fluid inlet means in fluid communication with the plenum chamber,

the fluid inlet port forming means being elongated in the direction of the length of the body member, the smallest cross-sectional area of the fluid inlet port forming means having a length dimension at least several times the width dimension of such area but not greater than one-half the length of the fluid discharge orifice means,

baffle means located within the plenum chamber interposed in the path of fluid moving from the fluid inlet port forming means through the plenum chamber to the fluid discharge orifice forming means, the baffle means being shaped to change the direction of movement of fluid passing through the fluid inlet port forming means and impinging on the baffle means, and

internal wall surfaces presented by the plenum chamber shaped to impart to fluid impinging on the baffle means and moving through each end portion of the fluid discharge orifice forming means movement having a component parallel to the associated surface of the web and in a direction toward the associated marginal portion of the web to thereby move liquid coating on the associated marginal portion of the web outwardly and downwardly relative to the surface of the web.

4,347,806

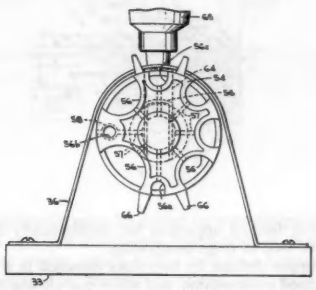
LIQUID DISPENSING APPARATUS

Dennis J. Argazzi, and Robert Burger, both of Newington, Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Oct. 30, 1980, Ser. No. 202,418

Int. Cl.[3] B05C *5/02*

U.S. Cl. 118—710 8 Claims



1. An apparatus for dispensing a liquid product for the coating of a workpiece, comprising, a housing having a cavity with a product inlet, a pump cylinder extending from said cavity and terminating in a valve controlled outlet, a piston shiftable between retracted and extended positions in said housing for pumping the product from said cylinder through said outlet means for actuating said piston, and a turret mounted on said housing for rotation about a horizontal axis and including a plurality of workpiece receiving seats for each receiving a workpiece of a different size, and said turret further including a plurality of product passageways respectively extending from said seats toward said outlet, one of said passageway communicating with said outlet in a predetermined rotative position of said turret.

4,347,807

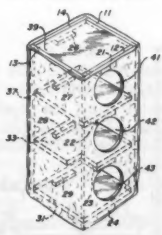
CAT CONDOMINIUM AND METHOD OF MAKING SAME

Marvin Reich, 1407 G St. NW., 3rd Floor, Washington, D.C. 20005

Filed Mar. 17, 1981, Ser. No. 244,555

Int. Cl.[3] A01K *1/03*

U.S. Cl. 119—19 10 Claims



1. A method of making a cat condominium comprising:

a. placing four panels on a work surface, said four panels being aligned side by side in a horizontal plane,

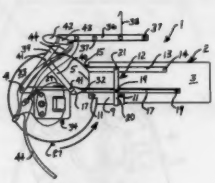
b. placing a continuous piece of carpet over said four panels and attaching said carpet to said panels,
c. erecting said four panels to form a box-shaped structure,
d. inserting rigid shelf members in a spaced relationship within said erected four panels, so as to form compartments, thereby forming a rigid cat condominium.

4,347,808

FROG FEEDING APPARATUS

Dozier Lester, 1156-F Guilbeau Rd., Duson, La. 70529

Filed Jan. 19, 1981, Ser. No. 226,057
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51 R **9 Claims**



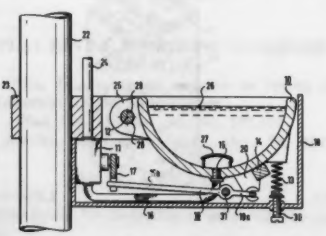
1. A frog feeding apparatus for automatically dispensing particles of food to frogs comprising:
(a) a hopper defined by two sides disposed in a generally V-shaped cross-section, and a first end closing one end of said hopper and a second end closing the opposite end of said hopper, said first end having a slot for containing and providing access in removing said particles of food;
(b) a frame attached to said hopper and including a bracket means extending beyond said hopper;
(c) an electric motor mounted on said bracket means and provided with a rotatable drive shaft extending from said motor in essentially perpendicular relationship to said bracket means;
(d) wheel means fixedly mounted on said drive shaft with a portion of the periphery of said wheel means in registration with said slot in said hopper, said wheel means rotatable with respect to said bracket means and responsive to activation of said electric motor; and
(e) food engaging means secured to the periphery of said wheel means for periodic traversal of said slot and engagement of the particles of food in said hopper when said wheel means rotates in registration with said slot.

4,347,809

DRINKING BOWL SYSTEM FOR FARM AND OTHER ANIMALS

Martin Glöggler, Memelstrasse 34, D-7910 Neu-Ulm, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,620
Int. Cl.³ A01K *7/02*
U.S. Cl. 119—81 **10 Claims**



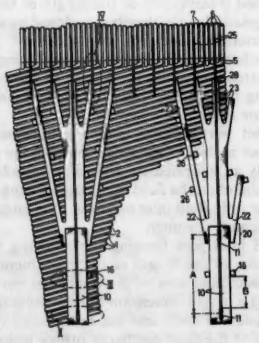
1. An automatic drinking bowl system for animals, the system being designed to be attached to a fixed stanchion, the system comprising: a drinking bowl designed to be moved against an upwardly directed restoring force including an adjustable spring, a housing surrounding said bowl, and being attached on one side to said stanchion, a turnpin assembly attached to said housing on a side of the housing adjacent to said stanchion, said turnpin assembly providing a horizontal axis, said drinking bowl being attached to said housing by said turnpin assembly so that the bowl can rotate around said horizontal axis of said turnpin assembly in such a manner that an edge of the bowl opposite said turnpin assembly moves in an arc, spring adjustment means, said bowl moving through a desired distance to a lower position under the weight of water let into the bowl by way of a continuously adjustable water inlet valve, said valve having an external control means for controlling the operation of said valve, and, on water being taken therefrom, said bowl is moved upwards by said restoring force into an upper position at which said valve is opened, the valve being shut in said lower bowl position, a flexible hose joining said valve with a water inlet opening of said bowl, said opening being in a part of said bowl which is lower down than the rest of the bowl, a valve activating means comprising a driving part connected on the exterior of said water inlet valve, said driving part acting to increase said inlet valve water flow when moved in one direction and to decrease the flow when moved in the opposite direction, a bowl ear attached to said bowl on the side of the bowl opposite the water inlet valve, a firstclass lever rotatable relative to said housing and located outside said flexible hose and outside said water inlet valve, a first end of said lever being connected to said bowl ear, and the second end of said lever being joined with said driving part.

4,347,810

COMBUSTION CHAMBER WALL

Karl Rees, Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 104,427, Dec. 17, 1979, abandoned.
This application Sep. 9, 1981, Ser. No. 300,662
Claims priority, application Switzerland, Dec. 20, 1978, 12930/78
Int. Cl.³ F22B *37/24*
U.S. Cl. 122—6 A **7 Claims**



1. A combustion chamber wall comprising
a plurality of wall tubes each having a horizontal vector;
a plurality of webs interconnecting said wall in gas-tight relation;
a plurality of vertical tubes;
vertical webs connecting said vertical tubes together in gas-tight relation to define at least one wall of a gas flue extending upwardly from said wall tubes;
pairs of vertically disposed tension strips in contact with said wall tubes and having fork-like prongs extending up-

wardly and laterally alongside said vertical tubes in secured relation thereto; and

a plurality of comb-shaped sheet-metal strips, at least two of said sheet-metal strips being vertically disposed between and secured to a respective pair of said tension strips in vertically spaced apart relation, each said sheet-metal strip being secured to a plurality of said webs in perpendicular relation thereto.

4,347,811

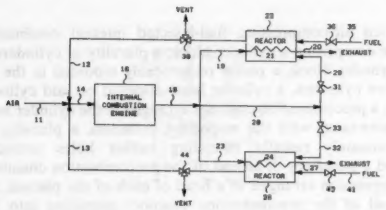
METHOD AND APPARATUS FOR REMOVING HYDROGEN SULFIDE FROM FUEL FOR AN INTERNAL COMBUSTION ENGINE

Roy C. Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 28, 1980, Ser. No. 125,434

Int. Cl.³ F02B 75/12

U.S. Cl. 123—1 A **6 Claims**



1. A method for removing hydrogen sulfide from a fuel being supplied to an internal combustion engine comprising the steps of:

(a) contacting a first stream of fuel with a first absorbing composition, capable of removing hydrogen sulfide from fuel for an internal combustion engine and capable of being regenerated in the presence of oxygen, to thereby remove hydrogen sulfide from said first stream of fuel;

(b) supplying the thus treated first stream of fuel to said internal combustion engine;

(c) contacting a second absorbing composition capable of removing hydrogen sulfide from fuel for an internal combustion engine and capable of being regenerated in the presence of oxygen, with a first stream of exhaust gases, which contain oxygen, from said internal combustion engine to thereby regenerate said second adsorbing composition;

(d) shutting off the flow of said second stream of fuel to said first absorbing composition;

(e) shutting off the flow of said first stream of exhaust gases from said internal combustion engine to said second absorbing composition;

(f) contacting a second stream of fuel with said second absorbing composition to thereby remove hydrogen sulfide from said second stream of fuel;

(g) supplying the thus treated second stream fo fuel to said internal combustion engine;

(h) contacting said first absorbing composition with a second stream of exhaust gases from said internal combustion engine to thereby regenerate said first absorbing composition; and

(i) sequentially repeating steps (a)–(h) to provide an alternate absorption/regeneration cycle for said first absorbing composition and for said second absorbing composition.

4,347,812

HYDRAULIC VALVE LIFT DEVICE

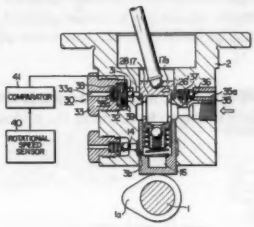
Tooru Kosuda, Okazaki; Michihiro Ohashi, Handa; Yasuhiro Takeuchi, Okazaki; Tadahide Toda, Mishima; Noboru Matsubara, Susono, and Masaaki Takizawa, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 27, 1979, Ser. No. 34,186

Claims priority, application Japan, Apr. 28, 1978, 53-51337; Jun. 6, 1978, 53-68073

Int. Cl.³ F01L 1/24

U.S. Cl. 123—90.55 **11 Claims**



1. In a hydraulic valve lift device for transmitting the movement of a cam to a combustion chamber valve of an internal combustion engine, which device includes a housing, a lifter slidably engaged in housing bore means, and a plunger slidably-engaged in said bore means and slidable in relation to said lifter and defining therewith an oil pressure chamber into which oil is introduced under pressure, said plunger being extended to move said valve away from its seating position and retracted to move said valve toward its seating position, the improvement comprising:

means defining a braking chamber between said plunger and said bore means, said chamber having opposed end walls and opposed side walls and being adapted to receive oil; and

slit means in one of said side walls forming a portion of a passage to relieve oil from said braking chamber as said plunger is retracted, said slit means having an opening area variable by movement of said plunger such that said opening area is gradually reduced as said plunger is retracted.

4,347,813

APPARATUS FOR STARTING AN INTERNAL COMBUSTION ENGINE

Paul Maucher, Sasbach, and Hugo-Werner Geschka, Düsseldorf, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,547

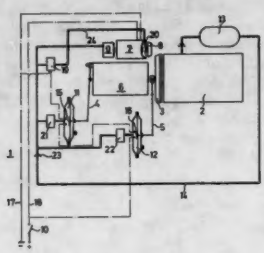
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853130

Int. Cl.³ F02N 5/04

U.S. Cl. 123—179 J **20 Claims**

1. Apparatus for starting an internal combustion engine, comprising a starter wheel, a starter motor for rotating said starter wheel, a flywheel rotatable by said starter motor, means for reversing the direction of rotation of said starter motor, and

a rotatable device connected to said starter motor, arranged so that said flywheel is rotatable when said starter motor is driven



to rotate in one direction, and said device is rotatable when said starter motor is driven to rotate in the opposite direction.

4,347,814

PRECHAMBER FOR AN AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINE

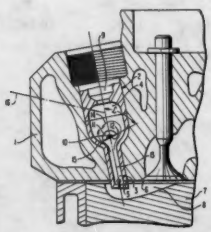
Wulf Besslein, Darmstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,313

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725344

Int. Cl.³ F02B *19/08*

U.S. Cl. 123—261 **14 Claims**



1. A prechamber for an air-compressing injection internal combustion engine, the prechamber comprising an enlarged space portion in communication with a cylinder space by way of a channel-shaped space portion, fuel being injected into the enlarged space portion from an injection nozzle generally in a direction of the channel-shaped space portion, and baffle means with a curved surface facing a fuel jet and provided in said enlarged space portion, characterized in that a bottom side of the baffle means is constructed as a guide surface means for the combustion air flowing into the enlarged space portion of the prechamber, the baffle means is arranged at an insert pin supported in the enlarged space portion, the guide surface means continues on the insert pin up to walls of the prechamber, and in that the guide surface means is constructed within an area of the baffle means as a bottom of a cut-in channel means.

4,347,815

AIR-COMPRESSING INTERNAL COMBUSTION ENGINE WITH A PRECOMBUSTION CHAMBER

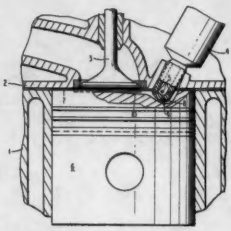
Hans-Georg Schmidt, Nürtingen-Hardt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,815

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923869

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—269 **2 Claims**



1. An air-compressing fuel-injected internal combustion engine comprising a cylinder block, a plurality of cylinders in the cylinder block, a piston reciprocably mounted in the respective cylinders, a cylinder head disposed on said cylinder block, a precombustion chamber arranged in the cylinder head and associated with the respective cylinders, a plurality of approximately radially extending burner holes provided around a periphery of an end of the precombustion chamber,

a depression arranged in a head of each of the pistons, the end of the precombustion chamber extending into the depression when an associated piston is in a top dead center position thereof, and

stellate depressions emanating from the depression in the cylinder head and corresponding in number and direction to the plurality of radially extending burner holes and being adapted in their cross-sectional shape to the form of the fuel-air mixture jets exiting from said burner holes, each of the stellate depressions ascending continuously in a radially outward direction for reducing the free volume between the piston and the cylinder head in the top dead center position, and

a further substantially axially extending burner hole being provided at the end of the precombustion chamber and oriented into the depression of the piston head, characterized in that

the stellate depressions each have a lenticular configuration.

4,347,816

FUEL/AIR MIXTURE SUPPLY SYSTEM WITH ADDITIONAL AIR SUPPLY

Masaaki Saito, Yokosuka; Yoshihisa Kawamura, Fujisawa; Yuko Sugo, Yokosuka, and Mitsumasa Inoue, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 17, 1979, Ser. No. 104,702

Claims priority, application Japan, Dec. 28, 1978, 53-162549

Int. Cl.³ F02B *15/00*

U.S. Cl. 123—308 **12 Claims**

1. In an internal combustion engine of the single-point fuel injection type, comprising a plurality of power cylinders each provided with an inlet valve and an inlet port passage leading to the inlet valve;

(a) an air suply system, comprising:

(a.1) a first intake passage having first and second ends and which takes in air at said first end:

(a.2) a plurality of first branch passages, one corresponding to each inlet port passage, each of which is connected at

one end to receive the air from the second end of the first intake passage, and each of which discharges air from its other end into a corresponding inlet ort passage;

(a.3) and means including a first throttle valve disposed in said first end of said first intake passage and mounted on a first shaft for controlling air flow, which controls flow of air through the air supply system;

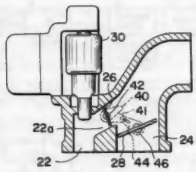
(b) a mixture supply system, comprising:

(b.1) a second intake passage, having an inclined end opening close to the first end of the first intake passage for taking in air at said inclined end;

(b.2) a mixture throttle valve mounted on a second shaft and disposed in said inclined end for controlling air flow in the second intake passage;

(b.3) a fuel injection valve, disposed adjacent the inclined end of the second passage so as to inject fuel in a direction in which the second passage extends into a point of the second intake passage downstream of the mixture throttle valve;

(b.4) and a plurality of second branch passages each having first and second passage ends, one of said second branch passages corresponding to each inlet port passage, each of said second branch passages being connected at said first passage end to receive a flow of air and injected fuel from



an other end of the second intake passage, and each of which discharges an air/fuel mixture from said second passage end into a corresponding inlet port passage;

(c) and means for interrelating the operation of the mixture throttle valve and the means for controlling the air flow to pass substantially no air flow when the mixture throttle valve is opened up to a certain predetermined opening, and which progressively controls the means for controlling the air flow to pass progressively more and more air through the air supply system as the mixture throttle valve opening is further increased beyond said certain predetermined opening, said interrelating means including a first lever mounted fixedly on said second shaft, coupling means including a second lever mounted on said second shaft, and a third lever mounted on said first shaft, wherein when the mixture throttle valve is first rotated to open, the first throttle valve is not rotated and remains closed, but when the mixture throttle valve is rotated to open past a certain intermediate position, said first throttle valve rotates to an open position;

(d) each second branch passage being of generally smaller cross-section than its corresponding first branch passage, and the second intake passage being of generally smaller cross-section than the first intake passage.

4,347,817

IDLE CIRCUIT SHUT-OFF VALVE

John E. Muller, Cold Spring, N.Y., assignor to Jolenn Energy Products Ltd., Monroe, N.Y.

Filed Oct. 23, 1980, Ser. No. 199,943
Int. Cl.³ F02M 7/12
U.S. Cl. 123—325 **12 Claims**

1. A valve needle assembly for a carburetor of an engine for a vehicle adapted to control fluid flow through a needle valve seat in a carburetor fluid passage, the carburetor having a bore adapted to receive a conventional idle adjustment screw, the valve needle assembly comprising:

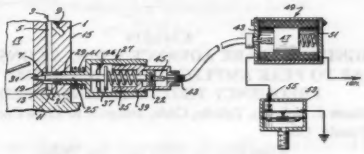
(a) an outer housing adapted to be attached at a first end to an opening of the bore on an outer surface of the carburetor extending into the carburetor to the fluid passage, said housing including a portion received in the bore;

(b) a closure member, the closure member being inserted into a second end of the outer housing;

(c) a needle member, the needle member passing through the outer housing at the first end of the housing and having a needle end adapted to be passed through the needle valve seat to restrict passage of fluid therethrough;

(d) a needle biasing means, the needle biasing means biasing the needle member toward the needle valve seat;

(e) a stop member fixed to the needle member, the stop member limiting travel of the needle member away from the needle valve seat, the stop member being an enlarged



portion on the needle member and wherein the stop member limits said travel by abutting against the closure member;

(f) electromechanical actuating means connected to the needle member, the electromechanical actuating means operating to withdraw the needle member away from the needle valve seat to the extent permitted by the stop member;

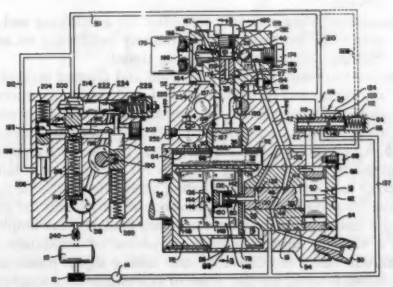
(g) an adjustment means, the adjustment means controlling the distance that the needle member is from the needle valve seat when the stop member has limited the travel of the needle member, wherein the first end of the housing is attached to the opening by threads, and the threads form the adjustment means.

4,347,818

EXTERNALLY CONTROLLED FUEL DELIVERY CURVE ADJUSTMENT MECHANISM FOR A FUEL INJECTION PUMP

Bryan M. Wysong, Hartford, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Apr. 21, 1980, Ser. No. 142,443
Int. Cl.³ F02D 7/00
U.S. Cl. 123—369 **5 Claims**



1. In a liquid fuel injection pump suited for the delivery of measured charges of liquid fuel under high pressure to an associated engine comprising a charge pump for delivering successive charges of fuel under high pressure for injection, means for metering the fuel charges delivered by the charge pump to provide a fuel charge measure correlated with engine

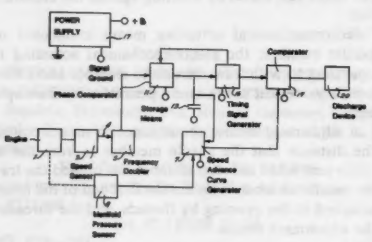
operating conditions, means for generating a fuel pressure correlated with the speed of the pump and means for overriding the metering means to limit the maximum fuel charge measure delivered by the charge pump in accordance with pump speed, the improvement wherein the overriding means comprises a piston mounted in a bore for longitudinal and rotational movement and longitudinally positioned in response to said pressure correlated with pump speed, said piston having a longitudinally extending cam with a longitudinally continuous peripheral cam surface having a longitudinally extending cam profile section formed by a surface of revolution around an axis which is nonparallel to the longitudinal axis of the piston, adjusting means for adjustably holding the piston in a preselected rotational position, and a follower engageable with said cam surface to vary said maximum fuel charge limit in accordance with the axial and rotational position of the piston.

4,347,819

IGNITION SPARK ADVANCE USING A CONSTANT PEAK TO PEAK AMPLITUDE TIMING SIGNAL WITH A FREQUENCY TIED TO ENGINE SPEED

William J. Roberts, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Dec. 3, 1979, Ser. No. 99,802
Int. Cl.[3] F02P 5/08
U.S. Cl. 123—415 27 Claims



1. A system for timing the occurrence of an event at a predetermined phase angle in the period of a cyclically operating device comprising means for producing a first timing signal having a substantially constant peak to peak amplitude, said first timing signal having an amplitude varying over a portion of a period of oscillation and with an instantaneous amplitude of said portion of said first timing signal being indicative of the phase of the first timing signal;

means for comparing and aligning the phase of said first timing signal with the phase of said cyclically operating device;

means including a clipper amplifier for amplifying and clipping said first timing signal thereby producing an amplified and clipped second timing signal;

means responsive to said amplified and clipped second timing signal and to a parameter of said cyclically operating device for producing an output signal at said predetermined phase angle of said cyclically operating device.

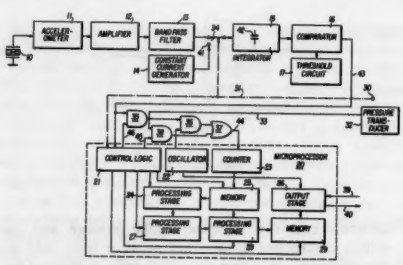
15. An ignition spark advance system for use with an internal combustion engine, having a means for sensing the rotational speed of said engine and producing an engine rotational signal, means for producing a spark advance signal, means for generating a timing signal having a constant peak to peak amplitude and a varying amplitude over its period of oscillation, said amplitude being indicative of said timing signal phase angle, and means to compare the phase of said engine rotational signal and said timing signal to produce a drive signal, said means for generating a timing signal having an input connected to receive said drive signal for driving the frequency of said timing signal toward an engine rotational signal frequency, means for amplifying and clipping said timing signal operatively connected to means for comparing said spark advance signal with said timing signal for producing a trigger signal and means responsive to said trigger signal for producing a high energy discharge spark.

4,347,820

PROCESS AND APPARATUS FOR ELECTRONIC ANGLE OF ADVANCE CORRECTION IN RESPONSE TO PINGING AND ENGINE CHARGE

Robert Deleris, Bailly, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 10, 1980, Ser. No. 215,057
Claims priority, application France, Oct. 12, 1979, 79 30179
Int. Cl.[3] F02D 5/04; F02P 11/02
U.S. Cl. 123—417 14 Claims



1. A process for electronically correcting the angle of advance of an internal combustion engine by means of detection of combustion noise signals with the aid of a transducer such as an accelerometer rigidly attached to the engine's cylinder head, wherein an accelerometric signal from the transducer is subjected to analogue processing, including in particular integration in a measurement window of given width to deduce therefrom a value for the noise signal A_i integrated in said measurement window, comprising:

calculating an integrated average noise value S_n, which is constantly re-updated by the last value taken, according to the formula,

$$\overline{S}_n = \overline{S}_{n-1} + \frac{A_i - S_{n-1}}{k}$$

in which S_{n-1} is the preceding average value; A_i is the last value taken for the integrated noise; k is a numerical filtering coefficient for re-updating the average value;

defining a pinging detection threshold C by the formula,

$$C = k_3 S_{n-1} + k_2$$

in which k_3 is a multiplier coefficient and k_2 a decrementing value;

comparing the last integrated noise value A_i to the pinging detection threshhold C defined from the value S_{n-1} relating to the same cylinder; and

correcting according to the result of the preceding comparison the point of advance under a strategy which depends on the engine's operating state.

4,347,821

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING ROTARY VALVE AND STEP MOTOR

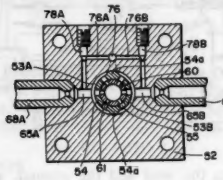
Masaaki Saito, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 9, 1980, Ser. No. 185,436

Claims priority, application Japan, Sep. 13, 1979, 54-126638[U]

Int. Cl.³ F02M *11/00;* **F02B** *33/00, 3/00, 75/10*

U.S. Cl. 123—440 **4 Claims**



1. In an air/fuel ratio control system for an internal combustion engine equipped with a carburetor which has a main fuel discharge passage provided with an air bleed and a slow fuel discharge passage provided with an air bleed, the control system having an air/fuel ratio detector which produces an electrical feedback signal representative of an actual air/fuel ratio of an air-fuel mixture supplied to the engine, a first auxiliary air-admitting passage connected to the main fuel discharge passage, a second auxiliary air-admitting passage connected to the slow fuel discharge passage, electrically operated flow control valve means for controlling the admission of air into the first and second auxiliary air-admitting passages and a control circuit which provides a control signal to the valve means so as to nullify a deviation of the actual air/fuel ratio represented by the feedback signal from a preset air/fuel ratio,

wherein said flow control valve means is a single rotary valve operable to simultaneously control the admission of air into both said first and second auxiliary air-admitting passages and operated by a single stepping motor which is driven in compliance with said control signal;

said rotary valve comprising a hollow outer cylinder fixedly held in a valve body and formed with a plurality of circumferentially arranged radial apertures with circumferentially equal intervals therebetween, and a hollow inner cylinder formed with the same number of circumferentially arranged radial apertures as said apertures of said outer cylinder with circumferentially equal intervals therebetween and rotatably fitted into said outer cylinder whereby said inner cylinder is rotated stepwise by said stepping motor to alternately assume a first position wherein the respective radial apertures of said inner cylinder are aligned with the respective radial apertures of said outer cylinder and a second position where the radial apertures of said inner cylinder are deviated from the radial apertures of said outer cylinder.

4,347,822

SINGLE POINT FUEL INJECTION WITH VENTURI ATOMIZATION

Gary L. Casey, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

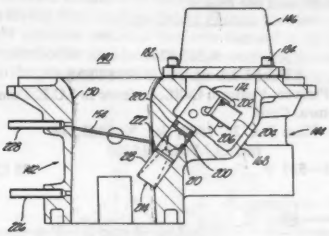
Division of Ser. No. 970,410, Dec. 18, 1978, abandoned, which is a continuation of Ser. No. 778,636, Mar. 17, 1977, abandoned.

This application Feb. 19, 1980, Ser. No. 122,551

Int. Cl.³ F02M *61/14*

U.S. Cl. 123—445 **5 Claims**

1. In a fuel management system for an internal combustion engine having a source of fuel supply, throttle body means mounted on the engine having throat means for delivering fuel to the engine and pump means including regulator means for delivering fuel from the supply to the engine, the improvement comprising fuel bowl means formed as part of the throttle body means having a cavity formed therein and an inlet connecting said cavity to the pump means for receiving fuel from said pump means, said fuel bowl means having an outlet formed therein communicating said cavity with the throat means, injector means disposed contiguous with said outlet and positioned in said fuel bowl means for controlling the flow of fuel from said cavity to the throat means, venturi means positioned in said outlet between said injector means and the throat means, and means for introducing air flow between said injector means and said venturi means for creating air flow through said venturi means and entraining fuel from said injector in said air flow.



4,347,823

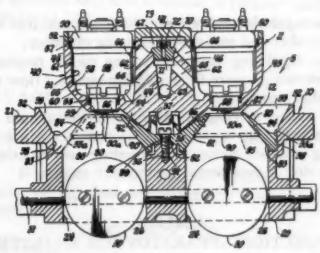
THROTTLE BODY INJECTION APPARATUS WITH DISTRIBUTION SKIRT

David R. Kessler, Churchville; Thomas J. Gutmann, and Charles E. Finn, both of Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1981, Ser. No. 237,291

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—472 **3 Claims**



1. A throttle body injection apparatus for a spark ignition, internal combustion engine comprising in combination: a throttle body having opposed inlet and outlet surfaces and at least one longitudinal cylindrical internal stepped wall defining a throttle bore extending from said inlet surface to said outlet surface and being adapted for communication at its inlet end with atmospheric air and at its outlet end with the intake manifold of the engine; a throttle valve of circular disc configuration pivotally positioned in said throttle bore intermediate said ends; an injector mechanism operatively connected to said throttle body, said injector mechanism including at least one fuel injector disposed above said inlet end and co-axial with said throttle bore, said fuel injector being adapted to receive low pressure fuel and to inject the same in pulses having a substantially hollow cone spray pattern; and, a distribution skirt of truncated, conical ring-like configuration operatively

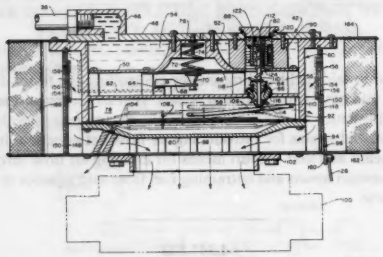
connected to said throttle body and positioned so that its convergent end is located next adjacent to and concentric with the discharge end of said fuel injector and so that its divergent end extends into said throttle bore upstream of said throttle valve, said distribution skirt thus being operative so as to divide the flow of atmospheric air into said throttle bore between a first flow path about the exterior of said distribution skirt and a second flow path through the interior of said distribution skirt whereby to effect improved air-fuel distribution in the charge being inducted into the engine.

4,347,824

LPG FUEL SUPPLY SYSTEM

William V. Pierson, Ventura, Calif., assignor to I.C.E. Company, Inc., Ventura, Calif.

Filed Jun. 26, 1980, Ser. No. 163,316
Int. Cl.³ F02M *15/00*
U.S. Cl. 123—527 **25 Claims**



1. An LPG fuel supply system for internal combustion engines comprising:

a housing having a fuel vaporizing chamber, a hot fluid circulating chamber adjacent said fuel vaporizing chamber and an air-fuel mixing chamber;

fuel inlet conduit means to said vaporizing chamber;

fuel inlet valve means in said vaporizing chamber responsive to the pressure in said vaporizing chamber to control the flow of fuel from said inlet conduit to said vaporizing chamber;

fuel flow regulation valve means between said fuel vaporizing chamber and said air-fuel mixing chamber;

fuel flow regulating valve activating means responsive to downstream pressure for activating said fuel flow regulating valve means; and

air inlet means to control the flow of air to said air-fuel mixing chamber;

mounting adapter means for mounting said housing on a carburetor of an internal combustion engine.

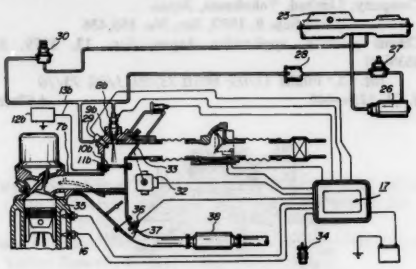
4,347,825

FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Suzuo Suzuki, Yokosuka; Yasuhiko Nakagawa, Kamakura; Hisamoto Aihara, Yokosuka, and Yasuo Matsumoto, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 14, 1980, Ser. No. 112,077
Claims priority, application Japan, Jan. 18, 1979, 54-4641
Int. Cl.³ F02M *27/04*
U.S. Cl. 123—537 **10 Claims**

1. A fuel injection apparatus for an internal combustion engine, wherein fuel is injected from an injection valve into a space defined by a wall of a fuel passage, comprising an electrode arranged in opposition to the injected fuel near the injection valve, and electrically insulated from the injection valve and the wall; first means for applying to the injection valve a first voltage; second means for applying to the electrode a second voltage; third means for applying to the wall a third voltage; the first, second and third voltages forming a high voltage electric field within the space, by which the injected fuel is electrified to have a polarity which is opposite to that of the electrode, and thus electrified fuel tends to be repulsed by the wall, characterized in that the third means consists of a



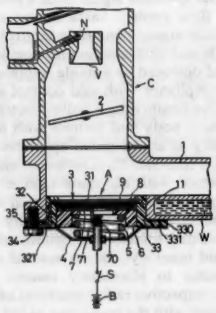
connection between the wall and the ground, and that the electrode consists of a ring and a wire or ribbon connected with the ring and extending downstream from the ring within and along the fuel passage.

4,347,826

FUEL EVAPORATOR FOR INTERNAL COMBUSTION ENGINE

Ken Nomura, Okazaki; Toshihiko Igashira, Toyokawa, and Seikou Abe, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 29, 1980, Ser. No. 202,173
Claims priority, application Japan, Oct. 31, 1979, 54-150836[U]
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—549 **13 Claims**



1. A fuel evaporator disposed in an intake manifold of an internal combustion engine, comprising:

a casing composed of

a metallic heating plate member;

a metallic supporting member which projects from the outer periphery of said heating plate member underwards;

a covering member made of heat resistant and electric insulating material, which covers the outer periphery of said supporting member; and

a bottom plate member which covers an opening formed by the lower ends of said supporting member and said covering member;

said covering member being closely inserted within a hole penetrating through said intake manifold so that said heating plate member is exposed to the interior of said intake manifold;

a heating element composed of a ceramic having positive temperature coefficient of resistance, which is closely fixed to the under surface of said heating plate member within said casing;

a cushion member composed of metallic fine wire fabric, which is closely fixed to the under surface of said heating element;

a spring member which is disposed on said bottom plate member within said casing so as to support said heating element through said cushion member and press said heating element against said heating plate portion; and

an electrically connecting means which electrically connects said heating element and an electric power source.

4,347,827

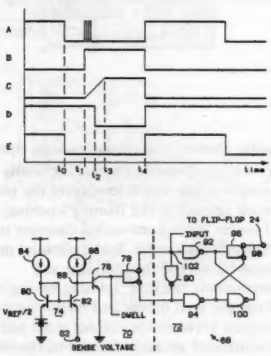
NOISE BLANKER CIRCUIT FOR USE WITH ELECTRONIC IGNITION SYSTEMS OR THE LIKE

James J. LoCascio, Mesa, Ariz., assignor to Motorola, Inc., Del.

Filed Jun. 1, 1981, Ser. No. 269,149

Int. Cl.³ F02D *1/00*

U.S. Cl. 123—618 **12 Claims**



1. A circuit having an input and an output which is responsive to periodic input signals applied to the input for transferring the same to the output at which is connected load circuit means, the circuit being made non-responsive to changes in the input signals which can occur during a portion of each period of each individual input signal a predetermined time interval after initiation of each periodic input signal due to noise transients being coupled onto each periodic input signal, comprising:

blanking circuit means responsive to control signals generated in response to each periodic input signal for producing a blanking signal at an output thereof during the portion of each period; and

coincidence circuit means having an input and output, said input being coupled both to said output of said blanking circuit means and the input of the circuit, said output being coupled to the output of the circuit, said coincidence circuit means transferring the periodic input signals between said input and output except during the portion of each period when said coincidence circuit means is inhibited by said blanking signal.

4,347,828

LAUNCHER FOR FLYING DISCS

Gerald L. Bridgeman, 421 N. Morrow, Drumright, Okla. 74030

Filed Mar. 17, 1980, Ser. No. 130,731

Int. Cl.³ F41B *3/04;* **A63H** *33/18*

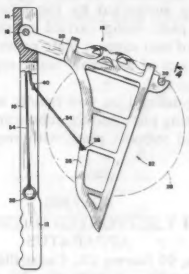
U.S. Cl. 124—5 **5 Claims**

1. A launcher for flying discs of the type having an integral circumferential rim, the rim having an inner circumferential surface, comprising:

a rigid handle having means at one end for manual engagement by the user;

an arm pivotally attached at its inner end to the other end of the handle, the arm having a basket portion for cradling a flying disc therein; and

a pin pivoted to said arm and arranged to engage the inner circumferential surface of the rim of a flying disc positioned in said arm basket portion prior to launching the flying disc, said pin being pivotal between a first upright position wherein the axis thereof is substantially perpendicular said basket portion surfaces in which position the pin is adapted to engage the inner circumferential



surface of a flying disc rim, and a second, outward position wherein the axis of the pin is substantially parallel to said basket portion surfaces, the pin serving to retain a flying disc in position in the basket during the first portion of a launch, the pin pivoting as a flying disc is launched by the force of a flying disc as it is flung outwardly from said arm basket portion, said basket portion including means providing parallel surfaces spaced apart slightly greater than the thickness of the flying disc for which the launcher is dimensioned, the surfaces being in planes parallel to the axis of said handle and arm.

2. A launcher for flying discs according to claim 1 wherein the pivotal connection of said arm and said handle includes stop means whereby said arm is limited in rotation to an arc of about 45° to about 180° relative to the axis of said handle.

4,347,829

ARCHERY BOW AND ARROW GUIDE SUPPORT AND ADJUSTMENT MEANS

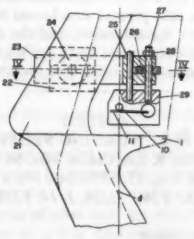
Rudolf Okupniak, Gerokstrasse 55, D-7080 Aalen, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,550

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2938809

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—24 R **4 Claims**



1. An archery bow, comprising:

a handle section;

arrow guide elements supported by said handle section and including bearing means for lateral positioning of an arrow with respect to said handle section and a support for the vertical guidance of the arrow;

a supporting plate having both said arrow guide element arranged thereon;

adjusting means joining said supporting plate to said handle section and being adjustable for moving said support plate with respect to said handle section, said adjusting means being adjustable for adjusting said support plate generally along the direction of the axis of an arrow that may be supported in position for shooting by the bow, said adjusting means including a rail attached to said handle section and extending generally in the direction of the axis of an arrow being supported by the bow for shooting, said supporting plate being carried on said rail for enabling movement of said support plate generally along the direction of the axis of an arrow being supported by the bow for shooting; and

a space being defined on said handle section for receiving said supporting plate and for submitting adjustment movement of said support plate with respect to said handle section.

4,347,830

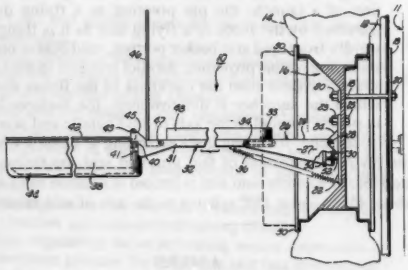
COLLAPSIBLY SUPPORTED OUTDOOR COOKING APPARATUS

Gary D. Runyan, 92 Norma Ct., Camarillo, Calif. 93010

Filed Nov. 8, 1979, Ser. No. 92,606

Int. Cl.³ F24C *1/16*

U.S. Cl. 126—9 R **16 Claims**



1. An outdoor cooking apparatus comprising:

a mounting bracket;

a collapsible cantilevered support having a first end and a second end and pivotally attached to the mounting bracket at the first end thereof, said support including an arm pivotally attached to the mounting bracket at one end of the arm, and an extension pivotally attached to the other end of the arm at one end of the extension; and

a pan, pivotally attached to the extension at the other end of the extension, said pivotal attachment being such that the pan folds over the extension, and the extension being of such size and shape so as to fit within the interior of the pan when the pan is folded over the extension.

4,347,831

FUEL BURNING STOVE

Peter Graziano, Rte. 4, Eau Claire, Wis. 54701

Filed Aug. 17, 1979, Ser. No. 67,466

Int. Cl.³ F24C *15/28, 1/14;* F23L *3/00*

U.S. Cl. 126—83 **3 Claims**

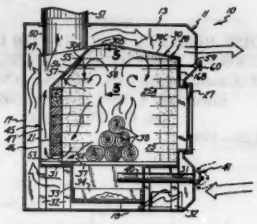
1. A stove comprising:

a stove housing having top and bottom walls and side walls defining an unobstructed combustion chamber having a combustion area located intermediate between the top and bottom walls;

a grate for holding fuel in the combustion chamber located beneath the combustion area for combustion of fuel in the combustion area;

a flue including flue wall means spaced from one of the stove housing side walls and defining a flue chamber and an upper flue opening for exhaust of products of combustion, said one side wall having a bottom edge spaced from the grate to provide a flue passage in communication with the combustion chamber and the flue chamber at a location beneath the combustion area in the combustion chamber;

a damper opening located in one of said stove housing walls



at a location above the combustion area, open to the flue chamber, and a closeable damper normally closing the damper opening and means to control the position of the damper with respect to the damper opening;

a draft inlet means to the combustion chamber to admit draft to the combustion chamber, said draft inlet means located at a position below the flue passage; and

a cabinet surrounding the stove housing having cabinet walls spaced from the wall means and means for circulation of air in the space between the cabinet walls and the housing walls to warm said air and return it to the room.

4,347,832

CONTROLLED AIR INTAKE APPARATUS FOR FURNACES AND THE LIKE

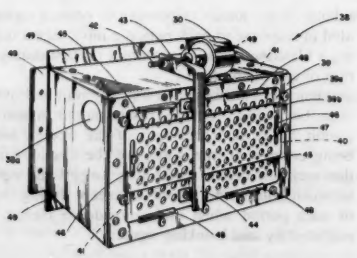
Delbert L. Myers, 3229 W. 32nd St., Anderson, Ind. 46011

Division of Ser. No. 76,341, Sep. 17, 1979, Pat. No. 4,274,392.

This application Mar. 4, 1981, Ser. No. 240,461

Int. Cl.³ F24H *3/00;* G05D *23/00*

U.S. Cl. 126—112 **3 Claims**



1. In a furnace having a burner, a combustion zone surrounding said burner, an air inlet opening permitting airflow from the atmosphere into said combustion zone and a flue in communication with the combustion zone, the flue having a closed updraft opening which remains closed under all operating conditions, the improvement which comprises:

a barrier plate disposed directly across said air inlet opening between the burner and the atmosphere, said barrier plate including a plurality of apertures arranged into a first pattern and adapted for introducing air into said combustion zone;

a cover plate disposed directly against said barrier plate, said cover plate including a plurality of openings arranged into second pattern; and

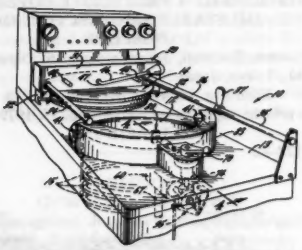
said cover plate being movable relative to said barrier plate between a first position wherein said second pattern of openings is in registration with said first pattern of apertures and a second position wherein said first and second patterns are completely out of registration with each other such that airflow into said combustion zone via said plurality of apertures is prevented.

4,347,833

PRESSURE COOKING DEVICE WITH EXHAUST AND DRAIN VALVES

Clement J. Luebke, Beloit, Wis., and Lowell W. Daniels, Rockford, Ill., assignors to Alco Standard Corporation, Valley Forge, Pa.

Filed Jun. 30, 1980, Ser. No. 164,245
Int. Cl.³ F24D *1/00*
U.S. Cl. 126—369 **9 Claims**



1. A cooking device comprising a base, an open-topped vessel mounted on said base and adapted to hold liquid, a cover for selectively closing and sealing said vessel, means for heating the liquid to create pressure in said vessel when the latter is sealed, means mounting said cover on said base for downward and upward shifting between an unsealed position and a sealed position, said cover being disposed in vertically aligned but non-telescoping and non-sealing relation with the open top of said vessel when said cover is in said unsealed position, said cover telescoping with said vessel and closing and sealing said vessel when said cover is in said sealed position, a pressure exhaust valve associated with said vessel and movable between a closed position permitting pressure to build up in said vessel and an open position relieving the pressure in said vessel, a manual member which is operable when shifted manually to move said valve between its positions, and safety means engageable with said cover for preventing said manual member from being shifted to move said valve to its closed position as long as said cover is in its unsealed position.

4,347,834

VARIABLE ENTROPY SOLAR ENERGY HARVESTER

Bernard H. York, 1725 Wayne St., Pomona, Calif. 91767

Filed Nov. 28, 1980, Ser. No. 211,372
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—424 **13 Claims**

1. A variable entropy solar energy harvester comprising

an absorber for absorbing the energy of the Sun's rays for conversion into another form of energy;

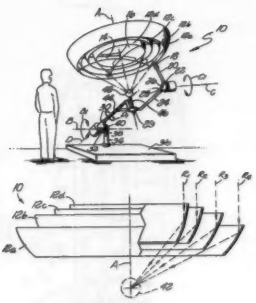
a frame distal from said absorber and disposed intermediate said absorber and the Sun;

means for supporting said frame and said absorber in said relationship;

Sun-tracking means operatively connected to said frame for movement therefore along two axes corresponding to the diurnal movement of the Sun along the East-West axis and the seasonal movement of the Sun along the North-South axis;

means for sustaining said absorber in a stationary position relative to said Sun-tracking movements;

a plurality of annular conic frusta of different diameters concentrically mounted on said frame with respect to an axial line passed through their geometric centers and in a stepped array, ascending from a base formed by the outermost of said frusta to a vertex formed by the innermost of said frusta, said array comprising annular gaps intermediate proximate frusta, said frusta circumscribing a conoid interior cavity, said frame comprising at least one cruciform stay fixedly connecting said frusta to one another



across said gaps and said cavity, each of said frusta comprising an outer surface and a light reflecting inner surface of arcuate profile defined by a singular and unique parabola whose focal length is different from but correlated with the focal length of each of the parabolas defining surface areas in said array, each of said frusta being inclined in an upwardly and outwardly slanting direction relative to said axial line for receiving incident solar rays and transmitting them by means of a single reflection through said annular gaps and said interior cavity onto said absorber, said absorber comprising a focal zone common to said light reflecting parabolic frusta and said focal zone having a common center of focus at the intersection of said two axes; and

means for moving said absorber along said axial line.

4,347,835

ALL SEASON WINDOW

Robert A. Seemann, 89 Earl Ave., Hamden, Conn. 06514

Filed Jun. 28, 1979, Ser. No. 52,770
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—431 **18 Claims**

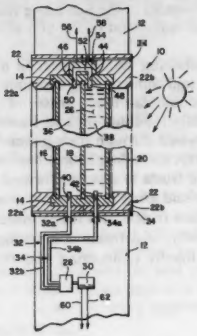
1. An all season window comprising:

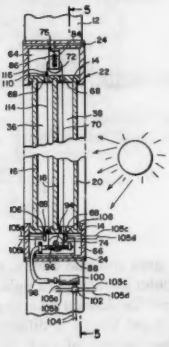
a peripherally extending pane mounting frame mounting said window in an exterior wall of a structure having an interior space;

first, second and third panes of essentially rigid transparent sheet material mounted sealingly and fixedly within said frame in spaced parallel relationship each to the other, said second pane being interposed between said first and third panes;

a discrete amount of solar heat ray absorbent material maintained either at a first location between said first and second panes to provide insulation from solar heat of said interior space or at a second location between said second and third panes to provide solar heat to said interior, said

discrete amount being sufficient to substantially fill only one of said locations at a time;





and means for selectively moving said solar heat ray absorbent material between said first and second locations.

4,347,836

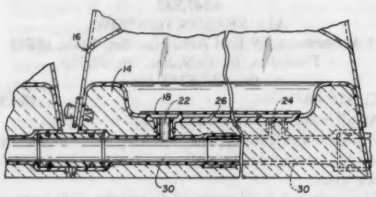
SOLAR HEATING SYSTEM

Arthur M. Frank, Plainview, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 885,356, Mar. 13, 1978, abandoned. This application Feb. 20, 1980, Ser. No. 122,935

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **13 Claims**



1. A solar collector assembly of thermally compatible material operable over wide temperature variations and having fluid input and output ports comprising:

a molded one piece collector assembly frame having oblique, depending side walls and a ribbed upper surface forming a plurality of passages in said upper ribbed surface;

an absorber plate of material thermally compatible with said frame bonded to said frame on said ribbed surface to be contiguous to said upper ribbed surface such that capillary passages are formed between said frame and plate with a leakproof seal formed therewith;

an input passageway internal to said frame extending from the input port of said frame to said capillary passages so as to place said absorber plate in fluid communication with the input port;

an outlet passageway integral to said frame and connecting said capillary passages to the output port to permit the flow of fluid from said capillary passages;

an interior cavity integral to said frame being defined by a bottom surface and the side walls of said frame;

a transparent molded collector assembly cover detachably mounted to said frame to enclose the upper surface of said frame;

mounting means attachable to the surface of said cover for securing said cover to said collector assembly frame, and

high temperature insulation material in said interior cavity and contacting the bottom surface of said frame.

4,347,837

STRUCTURE FOR PREVENTING THE BREAKAGE OF END PORTIONS OF A PROTECTIVE COVERING FOR THE ADJUSTABLE BEND SECTION OF AN ENDOSCOPE

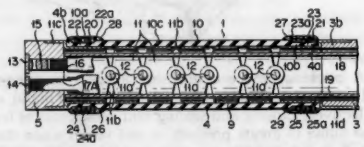
Saburo Hosono, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,543

Claims priority, application Japan, Sep. 17, 1979, 54-128388

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **5 Claims**



1. In an endoscope including a control section and an elongated insertion section extending from the control section extending from the control section and comprising an elongated flexible sheath having two ends, one of which is fixed to the control section, a distal end section, and an adjustable bend section comprising an elongated bendable core assembly having two ends, one of which is connected to the other end of the sheath, and the other of which is connected to distal end section, a protective covering which is made of elastic material, has two end portions and an intermediate portion between the two end portions, and encloses substantially the whole length of the core assembly, and threads wound around both end portions of the protective covering to fix both end portions to the core assembly in a sealed state, the improvement wherein the endoscope is further provided with a structure which comprises a first section for overlying and fixing the threads to the end portions of the protective covering, and a second section extending from the first section toward and overlying a portion of the intermediate part of the protective covering and fixed to the end portions of the protective covering, said structure being made of elastic material retaining elasticity and adhesivity at normal and temperatures up to about 200° C., thereby preventing the breakage of the end portions of the protective covering when said covering is subjected to repeated stress.

4,347,838

FOOT MASSAGER

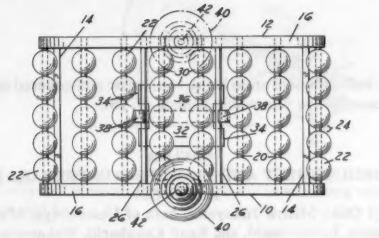
Kerry McCauley, 9607 E. Sturgeon Valley Rd., Vanderbilt, Mich. 49795

Continuation-in-part of Ser. No. 909,762, May 26, 1978, Pat. No. 4,198,962. This application Mar. 10, 1980, Ser. No. 128,501

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—33 **6 Claims**



1. A foot massager comprising a supporting frame, a plurality of non-cylindrical beaded rollers rotatably attached to the frame to dispose the beaded rollers into a generally convex arcuate massaging surface and positioned to place the beads in staggered relation to the beads of the next adjacent roller, and a rotatable spindle attached to the frame and extending above the convex arcuate massaging surface, said rotatable spindle being substantially formed as a non-cylindrical surface of revolution.

4,347,839

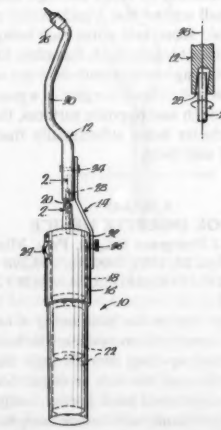
GUM MASSAGE DEVICE

William P. Youngclaus, Jr., Elm Grove, Wis., assignor to William R. Haljun, Kenilworth, Ill.

Filed Aug. 18, 1980, Ser. No. 178,846

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—62 A **5 Claims**



1. A gum massage device comprising a wand having a massage element at one end and a socket in the other end, a shaft frictionally engaged in said socket, said socket being angularly disposed relative to the axis of said shaft with said wand being rockable on said shaft, means for rotating said shaft, and means for resiliently holding said wand in substantial axial alignment with said shaft and preventing rotation of said wand, whereupon an oscillatory motion is imparted to said wand upon rotation of said shaft.

4,347,840

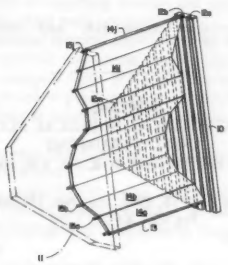
ORTHOPEDIC CORRECTIONAL SUPPORT SYSTEM

Gerald M. Adams, Huntsville, Ala., assignor to Orthotech, Incorporated, Herkimer, N.Y.

Filed Oct. 27, 1980, Ser. No. 201,355

Int. Cl.³ A61F *5/00*; A47C *3/00*

U.S. Cl. 128—70 **9 Claims**



1. An orthopedic chair having a back structure comprising

a plurality of elongated slat-like members extending laterally across the chair back, each of said members having a front surface;

means on the longitudnal edges of said slat-like members for interconnecting the members in edge-to-edge articulated relationship;

first and second support panels at opposite sides of said chair back; and

means on the inwardly facing portions of each of said support panels defining a plurality of recesses for receiving the ends of said slat-like members,

said members being insertable between said panels with the ends of said members in pairs of said recesses and with said members in edge-to-edge relationship in a selectable pattern of anterior-posterior locations so that the front surfaces of said members define a preselected curvilinear surface.

4,347,841

BIOLOGICAL WOUND COVERING AND METHOD FOR PRODUCING SAME

Janos Benyo; Tibor Papp, and Janos Tolnay, all of Miskolc, Hungary, assignors to Human Oltoanyagtermelo es Kutato Intezet, Godollo, Hungary

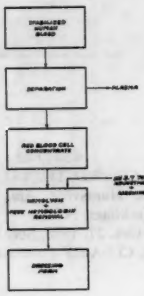
Filed Mar. 11, 1981, Ser. No. 242,710

Int. Cl.³ A61L *15/00*; A61K *35/14*

U.S. Cl. 128—156 **40 Claims**

1. A wound dressing for direct application to exposed tissue at a wound site for the treatment of superficial and deep burns

and as a temporary skin replacement, comprising as an active material stroma, subcellular elements and protein derived from



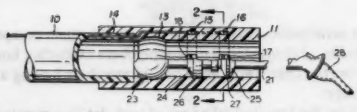
red blood corpuscle concentrate and free from free haemoglobin.

4,347,842

DISPOSABLE ELECTRICAL SURGICAL SUCTION TUBE AND INSTRUMENT

Mark Beale, 111 Old Hickory Blvd. No. 170, Nashville, Tenn. 37221

Filed Feb. 15, 1980, Ser. No. 121,669
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—276 **4 Claims**



1. The combination of an expandable electrosurgical suction tube comprising an elongated flexible tubular body member, a receptacle and on said tube, an annular groove within said receptacle end, electric contact means within said receptacle end, conductors for electrical current within said tubular body member, an annular groove in said receptacle end, said receptacle end being resilient; and an electrosurgical instrument comprising a hollow shaft, a hollow cautery on one end of said hollow shaft, an apertured sphere on the other end of said hollow shaft and a pair of spaced annular contacts on said hollow shaft inwardly from said apertured sphere, said apertured sphere on said hollow shaft adapted to register in said annular groove in said receptacle end to align said annular contacts with said electric contact means within said receptacle end.

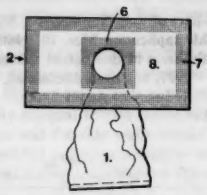
4,347,843

ILEOSTOMIC BAG

Brigitte C. R. De Zaepffel, c/o M.B.S. S.A. 6, bd James Fazy, Geneva, Switzerland (CH-1201)

Filed Jul. 25, 1980, Ser. No. 172,113
Claims priority, application Switzerland, Aug. 8, 1979, 7278/79
Int. Cl.³ A61F *5/44*
U.S. Cl. 128—283 **7 Claims**

1. An ostomic, plastic, selfadhesive pocket which comprises a smooth bag of plastic material transparent or opaque, protruding through an aperture made in a fixation sheet and having its opening fixed around the aperture of said sheet (2) that has two adhesive areas, one immediately surrounding the aperture where the bag is fixed and a second one separated from the first one by a non-adhesive zone of absorbing material, both adhesive areas being concentric and covered each by a non-adhesive removable pellicle (9, 10).

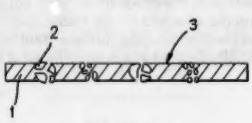


4,347,844

POROUS SHEET AND PROCESS FOR PREPARATION THEREOF

Kenji Ohki; Mistru Tokuyama, both of Utsunomiya; Masayuki Sagae, Ichikaimachi, and Kenji Kawabuchi, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,395
Claims priority, application Japan, Jan. 10, 1980, 55-1541
Int. Cl.³ A61F *5/44*
U.S. Cl. 128—287 **7 Claims**



1. A liquid impermeable, vapor permeable, porous sheet consisting essentially of a thin, flexible sheet made of non-foamed thermoplastic resin, said sheet having fine pores distributed over the entire surface area of said sheet, said pores penetrating between and through the opposite surfaces of said sheet to permit permeation of vapor through said sheet, said pores being of a small size so that liquid cannot substantially permeate through said sheet, said pores each being defined by a cluster of fragments of broken-apart, frangible, filler particles wherein the cluster of fragments extends between said opposite surfaces of said sheet and defines margins of a passage extending between and through said opposite surfaces, the outermost fragments of said cluster being substantially flush with said opposite surfaces of said sheet.

4,347,845

HOOK INSERTER DEVICE

Jack K. Mayfield, 12 Evergreen Rd., St. Paul, Minn. 55110

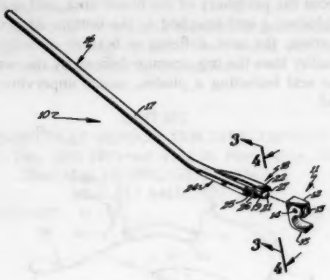
Filed Mar. 23, 1981, Ser. No. 246,296
Int. Cl.³ A61B *17/00;* A61F *5/04;* A61B *17/18*
U.S. Cl. 128—303 R **4 Claims**

1. A hook inserter device for positioning a hook used in spinal distraction or compressions systems, the hook including a hub having an axial opening therethrough and having a transverse opening through the hub arranged normal to the axial opening therein, a curved hook portion integral with the hub and extending therefrom, said device comprising:

an elongate bar including a handle portion and a hook mounting portion; when being used, said hook mounting portion is inserted into the axial opening in the hub of the distraction hook,

positioning means on said bar adjacent said hook mounting portion serves to prevent angular movement of a hook positioned on said mounting portion,

and releasable retention means on said bar releasably engaging a hook mounted on said mounting portion to posi-



tively but releasably retain the hook in mounting relation on said bar.

4,347,846

SURGICAL EXTRACTOR

Enrico Dormia, Lecco, Italy, assignor to Porges, Paris, France

Filed Oct. 14, 1980, Ser. No. 196,866
Claims priority, application Italy, Dec. 7, 1979, 27940 A/79
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—328 **2 Claims**

1. In a surgical extractor for removing bodies from natural passages, of the type comprising a flexible tube adapted to be inserted in a natural passage where the body to be extracted is located, the distal end of the tube having a retractable cage formed by flexible metal wires which are retractable inside the tube for positioning the tube in the passage and extendable for trapping the body to be extracted,

the improvement wherein the retractable cage is formed by a plurality of flexible metal wires arranged in pairs and disposed in helical paths, one wire of each pair being spiralled in clockwise direction and the other in anti-clockwise direction,

the wires of each pair intersecting at a single point between the ends thereof,

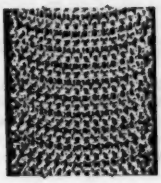
the spacing between wires in said cage being sufficient to permit the passage of said body into the interior of said cage.

4,347,847

METHOD OF HERNIA REPAIR

Francis C. Usher, 2219 Richmond Ave., Houston, Tex. 77098

Filed Jun. 6, 1980, Ser. No. 157,146
Int. Cl.³ A61B *17/04*
U.S. Cl. 128—334 R **3 Claims**



1. A method of repairing hernias and other defects of the abdominal and chest wall comprising,

placing a tubular surgical mesh over the defect in flattened form to provide continuous border edges,

the tubular surgical mesh being of a size sufficient to bridge the defect and to position the continuous border edges on tissue adjacent opposite sides of the defect free of selvedge edges,

suturing through the mesh adjacent the continuous border edges to the tissue,

the tubular surgical mesh being comprised of monofilament threads free of water-leachable irritant impurities and being physiologically inert even in the presence of infection, and

having a tensile strength sufficient when doubled to withstand wound tension,

the threads and the mesh having a diameter in the range of 5 to 15 mils, and

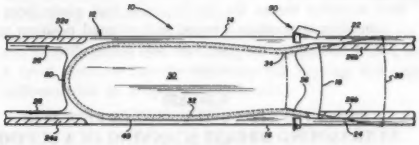
the mesh having 10 to 20 stitches per inch and being knitted in a continuous tubular shape with the threads being unattached to each other at their points of crossing.

4,347,848

SMALL ICE PACK

Vance M. Hubbard, Euless, and Welton K. Brunson, Bedford, both of Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Filed Sep. 5, 1980, Ser. No. 184,466
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—402 **8 Claims**



1. A refillable sanitary ice pack for single patient use comprising:

a generally rectangular envelope having an open end and a closed end, said envelope containing a waterproof bag member formed internally thereof, said bag member being open adjacent the open end of the envelope, said envelope being formed from a multiple ply material, said material including an inside layer of waterproof material, an intermediate layer of absorbent material and an outside layer of absorbent material perforated by a large number of small apertures to provide a wicking effect to reduce condensation;

a first pair of tie strings extending longitudinally of the envelope from the open end thereof;

a second pair of tie strings extending longitudinally of the envelope from the closed end thereof; and

a closure member for selectively sealing the bag member, said closure member having a blade-like member and a sheath member hingedly connected thereto for compressing said envelope against said blade-like member in said sheath member.

4,347,849

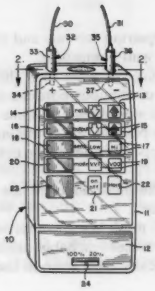
CARDIAC PACER HAVING QUICK-CONNECT LEAD TERMINALS

George L. Congdon, Fort Atkinson, Wis., assignor to Norland Corporation, Fort Atkinson, Wis.

Filed Nov. 25, 1980, Ser. No. 210,276

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 P **15 Claims**



1. In a cardiac pacer operable with a pacer lead having a connector pin, a connector system comprising:

connector guide means including a bore dimensioned to receive the pin;

a lock plate including an aperture dimensioned to slidably receive the connector pin, said lock plate being mounted for movement relative to a reference plane, whereby said aperture is brought into substantial registration with said bore to allow free insertion and removal of said pin when said lock plate is positioned toward parallel alignment with said reference plane, and is brought into substantial misregistration with said bore when said lock plate is moved toward non-parallel alignment with said reference plane to oppose movement of said connector pin through said bore; and

user actuated means for moving said lock plate from said non-aligned position toward said aligned position to release said connector pin from said connector.

4,347,850

DIRECT WATER COUPLING DEVICE FOR ULTRASOUND BREAST SCANNING IN A SUPINE POSITION

Elizabeth Kelly-Fry; Francis J. Fry, and George W. Gardner, all of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Inc., Indianapolis, Ind.

Filed Mar. 19, 1980, Ser. No. 131,669

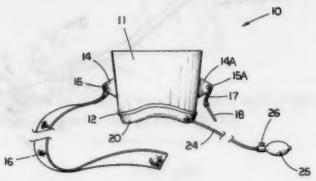
Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **7 Claims**

1. A direct liquid coupler for ultrasound scanning with an ultrasound transducer means of a breast area of a patient in a supine position, said coupler comprising:

(a) generally rigid wall means for maintaining a liquid within the breast area of the patient in a supine position, said wall means including a wall portion having an inside surface and an outside surface, the wall portion further defining a top opening and having a bottom edge portion, the bottom edge portion being contoured to conform to the shape of a human body about the periphery of a breast area including the curvature at the lateral chest wall area and the indentation of the breast bone area;

(b) sealing means for sealing the wall portion to the patient about the periphery of the breast area, said sealing means including a seal attached to the bottom edge of the wall portion, the seal defining a bottom opening which is smaller than the top opening defined by the wall portion, the seal including a pliable, water impervious material; and



(c) attachment means for attaching the wall portion directly to the patient to be supported by the patient so as to be movable with the patient and thereby movable relative to said ultrasound transducer means when said transducer means is at a fixed position in a position about the breast area with the seal being sealingly juxtaposed to the patient's body about the periphery of the breast area, said sealing means including said attachment means holding the seal tightly against the patient to provide a liquid tight seal.

4,347,851

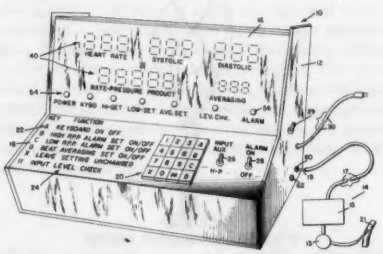
VITAL SIGNS MONITOR

Richard H. Jundanian, Whitinsville, Mass., assignor to Norman S. Blodgett and Gerry A. Blodgett, both of Worcester, Mass., part interest to each

Filed Oct. 21, 1980, Ser. No. 199,286

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—668 **5 Claims**



1. Vital signs monitor comprising:

(a) a sensor for sensing the heart beat and blood pressure of a patient and producing electrical pulses in a waveform indicative of the heart rate, systolic blood pressure, and diastolic blood pressure,

(b) a computer for receiving the electrical waveform pulses from the sensor, converting the waveform pulses into digital signals and calculating a rate-pressure product which is the product of the heart rate and the systolic blood pressure, said computer comprising:

(1) control means for counting the heart beats of the patient, averaging the heart rate, blood pressure and rate-pressure product for a plurality of heart beats and causing said averaged rate-pressure product valve to be displayed on the display screen,

(2) a heart beat memory connected to the control means

for determining the number of heart beats that constitute the rate-pressure product averaging value to be displayed on the screen,

(3) keyboard control switches for programming the heart beat memory to set the number of heart beats to be averaged, and

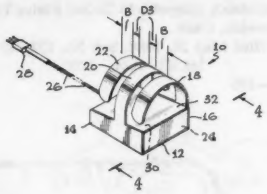
(4) a digital display screen connected to the computer for visually displaying the heart rate, blood pressure and rate-pressure product in digital form.

4,347,852

HEARTBEAT SENSOR HOLDING DEVICE

Josef K. S. Tan, 1891 Hillcrest Ave., St. Paul, Minn. 55116

Filed May 19, 1980, Ser. No. 150,712
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—687 **19 Claims**



1. A device for holding a heartbeat sensor in a relatively fixed relationship with respect to a user's fingertip, comprising:

a heartbeat sensor

a sensor holding structure for holding said sensor;

a base portion for holding said holding structure with said heartbeat sensor; and

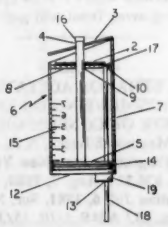
pressure producing means connected to said base portion for holding said user's fingertip against said heartbeat sensor, said pressure producing means comprising means for causing pressure between said heartbeat sensor and said user's fingertip to be greater at the portion of said user's fingertip closest to the end than at the portion of said user's fingertip farthest from the end, said sensor being contained in a wedge-shaped holding structure adapted to be held by said base portion, said holding structure having a wedge-shaped top side at which said sensor is exposed, so that the thickest portion of said holding structure is closest to the end of said user's fingertip.

4,347,853

CYCLE COUNTER FOR LUNG EXERCISER

Gordon A. Gereg, 557-A Blue Church Rd., Coopersburg, Pa. 18036, and Robert K. Rightler, Pennsburg, Pa., assignors to Gordon A. Gereg, Woodbury, Conn.

Filed Feb. 23, 1981, Ser. No. 236,648
Int. Cl.³ A61B *5/08*
U.S. Cl. 128—725 **2 Claims**



1. A device to be used to register or count cycles of vertical motion as would occur when a bellows was being used for a volume breathing exercise needing a very light actuating force, said counter assembly consisting of:

a. a push rod for sensing cycles of vertical motion;

b. a bearing rod having an indicator disc at one end to serve as a moving indicator;

c. a thin walled transparent elongated tube closed at one end, said closed end having a guide hole therein positioned eccentrically to the longitudinal axis of said tube, said elongated tube having an open opposite end cut at an angle with respect to the longitudinal axis thereof, a bearing disc mounted in said tube adjacent said open end and having two guide holes therein, one of said guide holes being aligned with the guide hole in said closed end of said tube, the other guide hole being centrally positioned therein, said bearing rod having said indicator disc being slidably mounted in said tube with said indicator disc located between said closed end and said bearing disc and said bearing rod passing through said central guide hole in said bearing disc, said indicator disc having a guide hole therein in alignment with the guide hole in said closed end of said tube, said push rod being slidably mounted in said aligned guide holes in said closed end, said indicator disc and said bearing disc and being of sufficient length to extend from within said elongated tube, said tube having calibrated graduations on its side to correspond with alignment of the indicator disc;

d. a first plane circular disc having a hole at its center and mounted over said bearing rod between said bearing disc and said open end of said tube, said hole having a small clearance to the diameter of said bearing rod, said first disc being sized to fit inside said elongated tube and overlie said guide hole in said bearing disc;

e. a second plane circular disc having a hole at its center and mounted over said bearing rod adjacent the open end of said tube, said hole having a small clearance to the diameter of said bearing rod, said second disc being sized to contact with its outer edge the upper-most point of the angle cut of said elongated tube;

f. whereby, in response to reciprocating movement of said push rod against said first disc, said first and second discs provide an escapement or one way motion of the bearing rod with indicating disc by alternately gripping or releasing the bearing rod due to the push rod forcing the first disc to jam at an angle to the bearing rod and carry it up with the push rod a calibrated distance to the second disc which can only stop downward motion due to being forced to jam on the bearing rod by the angle cut of the open end of the tube;

g. wherein each completed cycle would lift the bearing rod with the first and second discs jammed on it above the edge of the angle cut of the open end of the tube indicating visually the end of a cycle; and

h. said second disc constituting means to release the bearing rod with indicator disc by lifting the second disc back to a level position thereby allowing the bearing rod and indicator disc to drop and reset to zero.

4,347,854

BIFOLAR TEMPERATURE MEASURING APPARATUS

Scott P. Gosline, P.O. Box 41962, Atlanta, Ga. 30331; William F. Stembridge, and James C. Sturrock, both of P.O. Box 90756, East Point, Ga. 30364

Filed Oct. 15, 1979, Ser. No. 85,118
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—736 **10 Claims**

1. Hand-held apparatus for measuring the skin temperature of a living organism, comprising:

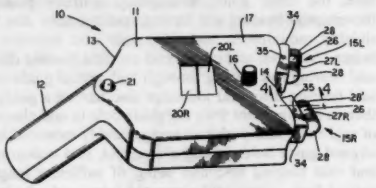
means defining a housing having a first portion configured to be manually grasped and having a second portion configured for disposition in proximity to the skin surface of a living organism;

a pair of temperature responsive means mounted in predetermined mutually spaced apart relation on said second portion,

each of said temperature responsive means being operative to produce an electrical signal in response to skin temperature adjacent the temperature responsive means;

circuit means carried by said housing means and selectably operative in response to said electrical signals from each of said temperature responsive means to provide a first temperature signal corresponding to the skin temperature served by said first temperature responsive means, and to provide a second temperature signal corresponding to the skin temperature served by said second temperature responsive means;

a pair of display means carried by said housing means and



respectively operative in response to said first and second temperature signals to provide a simultaneous visual indication of the skin temperatures observed by said pair of temperature responsive means;

said second portion of said housing means being configured to be traversed along the skin surface while said skin temperature sensing means remain in temperature sensing contact with the skin surface; and

means carried by said housing means and responsive to movement along the skin surface to produce a signal indicating the distance traveled by said skin temperature sensing means as said housing means is traversed along the skin surface.

4,347,855

METHOD OF MAKING SMOKING ARTICLES

Harry V. Lanzillotti, Midlothian; George H. Burnett, Richmond; Alline R. Wayte, Richmond; Thomas S. Osdene, Richmond; Warren E. Claflin, Bon Air; A. Clifton Lilly, Jr., Richmond, and John F. Nienow, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 171,314, Jul. 23, 1980, abandoned, which is a continuation-in-part of Ser. No. 148,124, May 9, 1980.
This application Sep. 18, 1981, Ser. No. 303,519
Int. Cl.³ A24B *3/14*
U.S. Cl. 131—78 **59 Claims**

1. A method of producing smoking articles comprising:

mixing combustible tobacco material with one or more other ingredients including a liquid to provide a tobacco mixture;

shaping the mixture under pressure into a discrete coherent mass;

providing at least one passage through said mass; and

drying said shaped mass,

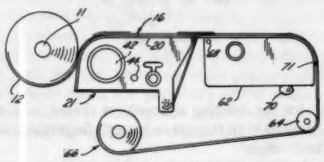
the mixture composition being selected and the shaping pressure and drying being controlled to impart to said shaped mass a porosity and density such as to substantially occlude gas flow therethrough and a porosity sufficient to support combustion of said shaped mass when ignited.

4,347,856

METHOD AND APPARATUS FOR REMOVING CIGAR WRAPPERS FROM THE WEB OF A BOBBIN

John Woltman; Donald W. Zarfos, both of Red Lion, Pa., and Robert F. Bulger, deceased, late of York, Pa. (by Mary L. Bulger, executrix), assignors to United States Tobacco Company, Greenwich, Conn.

Filed May 20, 1980, Ser. No. 151,743
Int. Cl.³ A24C *1/00*
U.S. Cl. 131—105 **13 Claims**



1. In apparatus for delivering cigar wrappers along a path from a bobbin to an overrolling zone in a cigar wrapping machine wherein said bobbin comprises a roll formed by a continuous web of sheet material and cigar wrappers positioned individually between the turns in the roll, the combination of, rigid means extending along a wrapper delivery path and presenting a first surface and a second surface which are separated by a gap defined by first and second parallel straight edges extending transversely of the direction of movement, roller means forming a loop path extending from said first edge to said second edge and positioned upon the opposite side of said gap from said path, said roller presenting a surface around which said web passes when moving from said first edge to said second edge, and means to draw said web continuously along said path on said first surface and around said first edge and along said loop path around said roller means and back to said second edge and along said second path, said first edge being effective to change the direction of movement of said web at a sufficiently sharp angle that each of the wrappers is peeled from the web and projects across said gap toward said second surface, whereby each of said wrappers passes from its position along said first surface across said gap to a position above said second surface where it rests upon a portion of said web which is moving away from said gap.

4,347,857

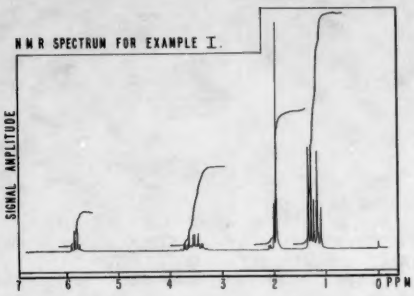
1-ETHOXY-1-ETHANOL ACETATE AND USES THEREOF FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS

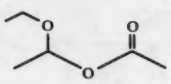
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,137.
This application Jul. 6, 1981, Ser. No. 280,273
Int. Cl.³ A24B *3/10, 15/30*
U.S. Cl. 131—276 **3 Claims**

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking tobacco an organoleptic property-modifying, augmenting or

enhancing quantity of 1-ethoxy-1-ethanol acetate having the structure:





4,347,858

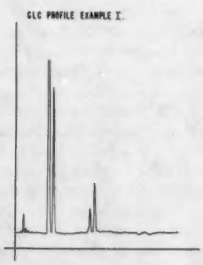
USE OF CARBOALKOXY ALKYL NORBORNANES FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF A SMOKING TOBACCO COMPOSITION OR AT LEAST A PORTION OF A SMOKING TOBACCO ARTICLE

Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

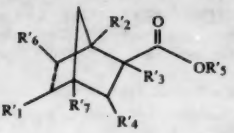
Division of Ser. No. 206,466, Nov. 13, 1980, Pat. No. 4,312,888, which is a continuation-in-part of Ser. No. 133,870, Mar. 25, 1980, Pat. No. 4,319,036. This application Sep. 17, 1981, Ser. No. 303,032

Int. Cl.³ A24B *3/10, 15/30*

U.S. Cl. 131—276 **3 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with smoking tobacco an aroma augmenting or enhancing quantity of at least one compound defined according to the generic structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; R_1',R_2',R_3',R_4',R_6', and R_7' are each selected from the group consisting of hydrogen and methyl and R_5' is C_1–C_4 alkyl with the provisos that:

1. one of R_1', R_2', R_6' and R_7' is methyl and the other of R_1', R_2', R_6' and R_7' represents hydrogen;
2. R_3' and R_4' are not both methyl;
3. when the dashed line is a carbon-carbon double bond, R_1', R_3' and R_4' are not all hydrogen when R_2' is methyl.

4,347,859

ACID CURING OF TOBACCO

Gordon H. Bokelman, Boulder, Colo., and Dewitt T. Gooden, III, Barnwell, S.C., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 9, 1980, Ser. No. 214,494

Int. Cl.³ A24B *3/12, 15/30, 15/42*

U.S. Cl. 131—290 **6 Claims**

1. A process for curing green tobacco comprising immersing the tobacco in an aqueous solution of an acid selected from the group consisting of acetic, phosphoric, hydrochloric, lactic, formic and 2-chloroethylphosphonic acids and incubating the immersed tobacco at at least room temperature.

4,347,860

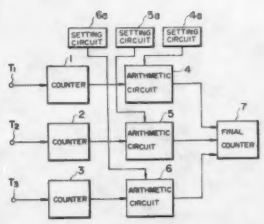
GENERAL COIN COUNTING DEVICE FOR AUTOMATIC VENDING MACHINE

Yukichi Hayashi; Osamu Sugimoto, both of Sakado, and Yutaka Yokohda, Kamifukuoka, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Oct. 27, 1980, Ser. No. 201,195

Int. Cl.³ G07D *9/00*

U.S. Cl. 133—1 R **1 Claim**



1. A general coin counting device for an automatic vending machine, which comprises:

a plurality of counters for counting the numbers of coins inserted, separately according to the denominations thereof;

a plurality of ratio setting circuits for suitably setting ratios corresponding to the denominations, respectively; and

arithmetic means for multiplying outputs of said counters by said ratios set by said ratio setting circuits,

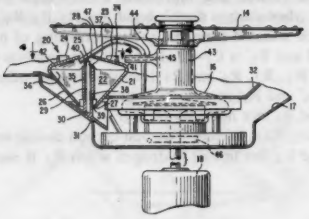
said ratios set by said ratio setting circuits being changed, whereby said general coin counting device can handle coins of any denominations.

4,347,861

DISHWASHER SOIL SEPARATOR

Jack F. Clearman, and Vincent P. Gurubatham, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 25, 1981, Ser. No. 238,356
Int. Cl.[3] B08B 3/02
U.S. Cl. 134—104 24 Claims



1. A soil separator for use in a dishwasher, comprising:

wall means defining a pump chamber having an inlet opening and an outlet opening spaced from the inlet opening;

pump means in the chamber for pumping liquid from the inlet opening through the chamber and outwardly through the outlet opening as an incident of rotation of the wall means about an axis of rotation thereof;

means for supporting the wall means for rotation about said axis of rotation;

reaction means on the wall means arranged to be responsive to a liquid stream directed thereagainst for rotating the wall means about said axis; and

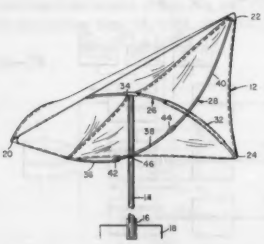
collecting means responsive to rotation of said wall means for collecting soil from liquid being pumped through said chamber.

4,347,862

LAWN UMBRELLA

Edward Secon, Trumbull, Conn., assignor to The Sherwood Corporation, Spring City, Tenn.

Filed May 22, 1981, Ser. No. 266,459
Int. Cl.[3] A45B 11/00, 17/00
U.S. Cl. 135—20 R 7 Claims



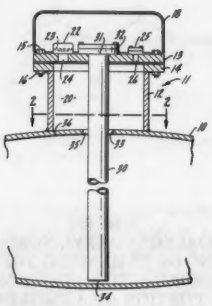
1. A lawn umbrella comprising, a mast, means for journally mounting said mast for rotation about a vertical axis, a flexible shade having a generally quadrilateral configuration disposed above the mast, a first strut having a bowed configuration between its ends, means for fastening the ends of the first strut to a first pair of opposed corners of the shade with the strut bowed such that the center of curvature is beneath the shade, means for mounting said first strut on the top of the mast for pivotable movement relative to the mast about an axis substantially normal to the axis of the mast, a second strut having a bowed configuration between its end, means for fastening the ends of the second strut to a second pair of opposed corners of the shade with the strut bowed such that the center of curvature is above the second strut, and means for mounting the second strut on the mast for transverse movement relative to the mast.

4,347,863

COMBINED SAFETY VENT AND SIPHON UNLOADING NOZZLE FOR LIQUID TRANSPORTATION VEHICLE

John T. Keyes, Greenville, S.C., assignor to Union Tank Car Company, East Chicago, Ind.

Filed Jul. 14, 1977, Ser. No. 815,481
Int. Cl.[3] B67D 5/54
U.S. Cl. 137—212 3 Claims



1. A vehicle for transporting a liquid commodity comprising:

(a) a closed tank for containing such liquid commodity;

(b) a combined safety vent and siphon unloading nozzle mounted on the top outside surface of said tank having an open-ended upstanding side wall extending above said tank and a generally horizontal coverplate spanning the open end, said side wall, cover plate and top surface defining a closed surge chamber on the outside of said tank that communicates with the inside of said tank through a hole in said top surface;

(c) a safety vent including a replaceable frangible element mounted on said cover plate and communicating with said closed chamber through said cover plate;

(d) a siphon unloading pipe of predetermined outside diameter having its upper end mounted in said cover plate and means closing said pipe upper end, said siphon pipe extending downwardly through said closed chamber and continuing through said hole in said top surface and into the inside of said closed tank, the lower end of said siphon pipe terminating adjacent the bottom of said closed tank;

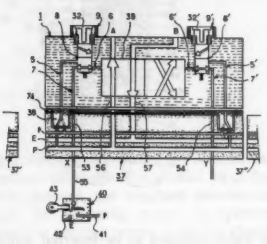
(e) said hole having a predetermined diameter slightly larger than said outside diameter of said siphon pipe so as to define an annular surge pressure transmitting opening around said siphon pipe for dissipating transient surge pressure of said tank into said chamber without causing premature rupture of said frangible element, and

(f) said liquid commodity being unloaded from said tank through said siphon pipe by opening said means closing the upper end of said siphon pipe and connecting a source of pressurized air to air pressure inlet means for said tank.

4,347,864
AUXILIARY CONTROL DEVICE FOR PNEUMATIC DISTRIBUTOR

Daniel Bouteille, Ville D'Avray; Michel Nicolas, Plaisir, and Pierre Prudhomme, Saint Germain en Laye, all of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 50,856, Jun. 21, 1979, abandoned. This application Apr. 15, 1981, Ser. No. 254,802
Claims priority, application France, Jun. 21, 1978, 78 18518
Int. Cl.³ F16K *31/11*
U.S. Cl. 137—269 **4 Claims**



1. In a pneumatic control system comprising a distributor and an external pilot switch having an output, a first input, a source of permanent pressure connected to the said first input, a second input connected to an exhaust pressure and actuating means for connecting said output to said first or second inputs, a pneumatic distributor comprising:

(a) a body having a first face and a second face;

(b) a two-state valve received in said body, having a permanent pressure input and an exhaust opening both on said first face, two cylinder outputs and at least one control input;

(c) at least a cylindrical housing located in said body, said housing having a first threaded inner surface portion opening on said second face, and a second inner surface portion opposite to said first inner portion;

(d) a first feeding channel having a first end opening on said first face and a second end opening on said second inner surface portion at a first distance from said second face, said first end being normally connected to the output of said external pilot switch for receiving external pneumatic control signals;

(e) a second feeding channel having a first end opening on said first face and a second end opening on said second inner surface portion at a second distance from said second face, said first end being adapted to receive a permanent pressure;

(f) a control channel having a first end connected to said control input and a second end opening in said second inner surface portion at a third distance from said second face;

(g) a pneumatic commutation sub-assembly comprising a hollow body having an outer surface and a transverse face, said outer surface being provided with a pilot orifice, with a first feeding orifice and with a second feeding orifice, a valve located in said hollow body and movable between a first position wherein said pilot orifice is connected to said first feeding orifice and a second position wherein said pilot orifice is connected to said second feeding orifice;

(h) resilient means located in said sub-assembly body and adapted to place said valve in its first position;

(i) a movable tumbler located in said hollow body, having an actuating end located in the vicinity of said transverse face and an opposition end remote from said transverse face, said opposite end cooperating with said valve for displacing it from its first position to its second position when said actuating end is depressed;

(j) said sub-assembly being so inserted in said second inner surface portion that said first orifice, said second orifice and said pilot orifice register and form a tight joint, respectively with the second ends of said first feeding channel, said second feeding channel and said control channel;

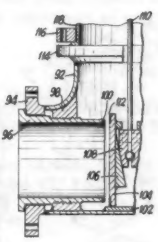
(k) a removable stopper having an outer transverse surface portion, a cylindrical threaded outer surface portion, a transverse end face opposite to said outer transverse surface portion, a cylindrical bore longitudinally extending between said outer transverse surface portion and said transverse end face, and a cylindrical pusher located in said bore, said pusher having an outer end, an intermediate outer surface portion adapted to slide in said bore in a tight manner and an inner end opposite to said outer end;

(l) said cylindrical threaded outer surface portion of the stopper being so associated with said first threaded inner surface portion of the cylindrical housing that said transverse end face of the stopper tightly closes said second inner surface portion of the cylindrical housing and that said inner end of the pusher cooperates with said actuating end of the tumbler when said outer end of the pusher is depressed.

4,347,865
FABRICATED GATE VALVES

Arthur C. Worley, Morristown, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 895,918, Apr. 13, 1978, abandoned. This application Jun. 17, 1980, Ser. No. 160,557
Int. Cl.³ F16L *7/00*
U.S. Cl. 137—375 **3 Claims**



1. A gate valve comprising housing means having a hollow interior and opposed coaxial tubular ends each with an integral end flange, cylindrical tubular means removably carried by said housing means extending between said ends and fixedly secured to said end flanges and with said housing means during operation of said valve and having a central axis along which fluid is adapted to flow, said tubular means terminating internally of said housing means opposite from said end flanges in spaced seat means integral at the inner end of each said tubular means and removable with said tubular means through a selected one of said tubular ends, said seat means disposed normal to said axis to form a parallel gap therebetween, gate means situated internally of said housing means and having a closed position engaging said seat means only in a plane normal to said axis for providing a fluid-tight seal and preventing flow of fluid through said tubular means and an open position situated beyond the axis of said tubular means for enabling flow of fluid therethrough, said tubular means being in removable threaded engagement with said housing means for a short axial distance at said end flange for a distance substantially less than the axial length of the tubular means and of the adjacent housing, the non-treaded portion of said tubular means having an outside diameter substantially less than the inside diameter of said housing means to provide an annular clearance therebetween to thereby thermally shield said housing from temperature influences produced by the fluid which flows through said tubular means, moving means operatively connected for moving said gate means between said open and closed positions

thereof, said moving means when moving said gate means from said open to said closed position first moving said gate means transversely with respect to said axis to a position of alignment with said seat means while still being spaced therefrom, and stop means situated in said housing means in the path of movement of said gate means from said open toward said closed position thereof for stopping the movement of said gate means by said moving means transversely with respect to said axis when said gate means reaches said position of alignment with said seat means, said moving means after displacing said gate means to said position of alignment determined by said stop means then cooperating with said gate means for displacing the latter only in an axial direction into said fluid seal engagement with said seat means to assume said closed position, said stop means guiding said gate means during seating movement thereof into engagement with said seat means by the continued operation of said moving means.

4,347,866

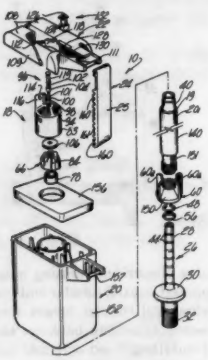
BALLCOCK ASSEMBLY

Albert E. Straus, Erie, Pa., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Division of Ser. No. 36,399, May 7, 1979, Pat. No. 4,286,619. This application May 8, 1981, Ser. No. 261,742

Int. Cl.³ F16K *31/26, 47/08*

U.S. Cl. 137—436 **7 Claims**



1. A ballcock valve assembly for controlling the supply of liquid to a liquid storage tank comprising,

a standpipe through which liquid is conveyed to said storage tank,

valve means on said standpipe for controlling the delivery of liquid to said tank,

means forming a liquid distribution chamber in communication with said valve means, said chamber having at least one discharge opening through which said liquid flows from said chamber,

said standpipe including an outlet tubular member in communication with said discharge opening and providing a liquid outlet flow passageway from said chamber to said tank,

said tubular member including flow restrictor means for restricting said discharge opening, said flow restrictor means being operable in response to rotation of said tubular member about the longitudinal axis thereof and with respect to said discharge opening to adjust the flow of liquid from said discharge opening through said passageway.

4,347,867

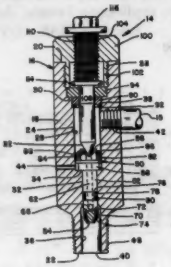
SAFETY VALVE

Clifford M. Peters, Longview, Tex., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Dec. 29, 1980, Ser. No. 221,129

Int. Cl.³ F16K *17/00*

U.S. Cl. 137—460 **9 Claims**



1. A safety valve adapted to be inserted within a flowline comprising:

an elongate valve body having a longitudinally extending central bore, said valve body having a fluid inlet in fluid communication with said bore, a fluid outlet in fluid communication with said bore and spaced longitudinally from said fluid inlet;

a slidable valve element mounted within said bore between said fluid inlet and said fluid outlet and slidable between seated and unseated positions relative to said valve body, said valve element having a fluid passage within an inlet port thereof in fluid communication with said fluid inlet in the seated position and an outlet port thereof normally in fluid communication with said fluid outlet in the seated position, said outlet port being positioned at an outer end of said valve element along its longitudinal axis and having a seat thereabout;

a stop member mounted on said valve body for relative movement between extended and retracted positions and having a stem extended within said bore along the longitudinal axis of said valve body, said stop member when in a retracted position permitting movement of said valve element to the unseated position and when in a fully extended inward position engaging said valve element and holding said valve element in the seated position on said valve body, said stem being seated on said seat about said outlet port in said fully extended position and blocking fluid flow through said valve element to said fluid outlet; and

sealing means, positioned between said fluid inlet and said inlet port, for providing a fluid-tight seal between said inlet port and said fluid inlet in the unseated position, said sealing means in the seated position permitting fluid flow between said fluid inlet and said inlet port.

4,347,868

RELATING TO DEVICES FOR THE CLOSURE OF FLUID FLOW LINES

Michael J. Scott, Feilding, New Zealand, assignor to Allflex International Limited, Palmerston North, New Zealand

Filed Nov. 13, 1980, Ser. No. 206,515

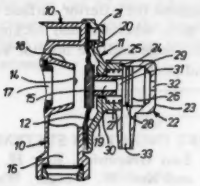
Claims priority, application New Zealand, Nov. 14, 1979, 192114; Jun. 11, 1980, 194014

Int. Cl.³ F16K *17/00*

U.S. Cl. 137—462 **14 Claims**

1. A device for closing a fluid flow passage in response to a decrease in vacuum pressure existing in the passage, said device comprising a fluid flow passage, a seating in the passage, a diaphragm located so that one face thereof can locate on said seating to close said passage, a chamber which is partially

formed by the or at least part of the other face of said diaphragm, said diaphragm in use, being maintained away from said seating by a higher pressure in said chamber due to a pressure differential between said chamber and passage, venting means to open said chamber to atmosphere, means to seal said venting means, and actuating means which engages with



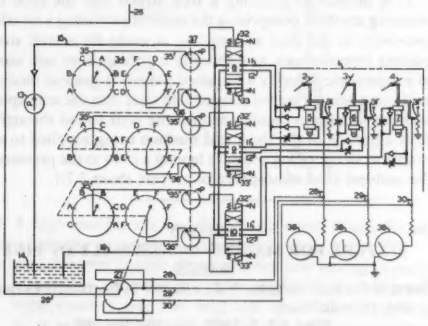
said diaphragm when said pressure differential exists such that when the pressure differential is altered by a decrease in the vacuum in said passage, the resultant movement of said diaphragm causes the actuating means to operate the sealing means such that the venting means vent said chamber such that said diaphragm can locate on said seat.

4,347,869

HYDRAULIC VALVE POSITION CONTROL SYSTEM FOR REGULATING SMOKESTACK EXHAUST PRESSURE

Richard A. Strobel, and Michael D. Lyons, both of Lexington, Ky., assignors to American Standard Inc., Lexington, Ky.

Filed Dec. 14, 1979, Ser. No. 103,802
Int. Cl.³ F16K *37/00*; F23N *3/00*
U.S. Cl. 137—488 **12 Claims**



1. A control system for adjusting a plurality of butterfly valves arranged in a substantially horizontal plane of a furnace smokestack to regulate the stack exhaust pressure, comprising:

(a) a source of hydraulic fluid under pressure;

(b) a hydraulic power cylinder for each said butterfly valve having a double-acting piston and linkage connecting said piston to a respective one of said butterfly valves to effect operation thereof in an opening or closing direction;

(c) a solenoid actuated, three position spool valve device having a first position in which hydraulic fluid is connected from said source to one end and is concurrently exhausted from the other end of said double-acting piston of a respective one of said power cylinders, a second position in which hydraulic fluid is connected from said source to said other end and is concurrently exhausted from said one end of said double-acting piston of a respective one of said power cylinders, and a third position in which said supply and exhaust of hydraulic fluid is terminated;

(d) means for selectively establishing a command signal representative of the desired exhaust pressure in said smokestack;

(e) means for establishing a feedback signal representative of the actual exhaust pressure of said smokestack; and

(f) first circuit means operative in response to a difference between said command and feedback signals for operating said spool valve device of said one of said power cylinders to said first or said second position depending upon the sense of said difference between said command and feedback signals, and operative in response to equality between said command and feedback signals for operating said spool valve device of said one power cylinder to said third position, thereby adjusting the degree of opening or closing of said butterfly valve associated with said one of said power cylinders and accordingly providing a fine adjustment of said smokestack exhaust pressure; and

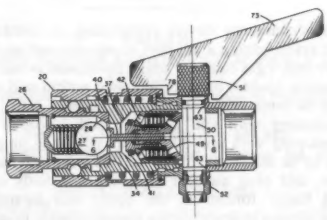
(g) second circuit means operative concurrently with said first circuit means in response to said difference between said command and feedback signals in excess of a predetermined amount for operating said spool valve device of another one of said power cylinders to said first or said second position depending upon the sense of said difference between said command and feedback signals, and operative in response to said difference between said command and feedback signals being less than said predetermined amount for operating said spool valve device of said another power cylinder to said third position, thereby adjusting the degree of opening or closing of said butterfly valve associated with said another power cylinder concurrently with said adjustment of said butterfly valve associated with said one power cylinder and accordingly providing a coarse adjustment of said smokestack exhaust pressure.

4,347,870

LEVER-TYPE QUICK DISCONNECT COUPLING

Ojars Maldavs, Lincoln, Nebr., assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 14, 1980, Ser. No. 149,628
Int. Cl.³ F16L *37/28*
U.S. Cl. 137—614.05 **8 Claims**



1. A lever-type quick disconnect female coupling for coaction with a check-valve equipped male coupling, the female coupling comprising:

(a) a generally tubular housing having a forward end and a rearward end and an axially extending bore open at said forward end for receipt of said male coupling, the housing being provided with a valve seat within the bore,

(b) a valve assembly slidably mounted in said bore for movement axially of said bore, the valve assembly including a valve which is engageable with said valve seat in the bore and a tubular rear end portion which is provided with an opening therethrough which extends transversely to the axis of said bore of the housing,

(c) a pusher member slidably mounted in said valve assembly for movement axially of said bore, the pusher member including a tubular rear end portion which is slidable axially within the rear end portion of the valve assembly,

(d) cam means mounted in said housing and engageable with said valve assembly and said pusher member for moving the valve assembly and the pusher member in opposite directions, said cam means including a shaft which extends through the opening in the valve assembly and is engageable with the rear end portion of the pusher member and which is rotatable about an axis which extends transversely to the axis of the bore, the shaft having a first camming portion which is engageable with an edge portion of the opening in the valve assembly for moving the valve assembly axially in one direction and a second camming portion which is engageable with an edge portion of the rear end portion of the pusher member for moving the pusher member axially in the opposite direction, the cam means being movable between a first position in which the valve of the valve assembly engages said valve seat and the pusher member does not open the check valve of the male coupling and a second position in which the valve of the valve assembly is moved axially away from the valve seat to provide a fluid passage therebetween and the pusher member is moved axially toward the male coupling to open the check valve of the male coupling, and

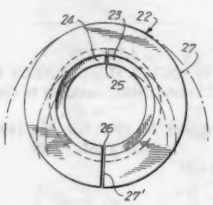
(e) a lever attached to the cam means for moving the cam means between said first and second positions.

4,347,871

PRESSURE ACCUMULATOR WITH LOCKING NUT

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed May 4, 1978, Ser. No. 902,972
Int. Cl.³ F16L 55/04
U.S. Cl. 138—30 **2 Claims**



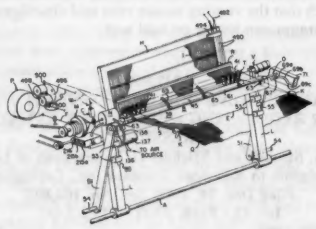
1. An accumulator device comprising, in combination, a pressure vessel having a gas port at one end and an oil port at the other end, a gas charging valve positioned in said gas port, a deformable bladder member mounted within said vessel and dividing the same into two chambers, namely, a first chamber communicating with said gas port, and a second chamber communicating with said oil port, a cylindrical plug member adapted to be inserted through said oil port into said second chamber, said plug member including a radially outwardly directed flange formed at the upper end thereof, and a threaded portion in downwardly spaced relation to said flange, the outer diameter of said flange being smaller than the inner diameter of said oil port, an annular seal ring receiver groove formed on the external surface of said plug member in spaced relation to said flange between said flange and said threaded portion, a seal ring seated in said groove and projecting radially beyond said plug, the outer diameter of said ring corresponding essentially to and engaging against the inner surface of said oil port, a locking member interposed between the under surface of said flange and the upper inside surface of said vessel surrounding said oil port, said locking member including a plurality of rigid arcuate metallic segments defining a ring having an inner diameter less than the diameter of said port and an outer diameter greater than the diameter of said port, the adjacent ends of said segments being disposed in close juxtaposition to define a substantially continuous surface, and an annulus of resilient elastomeric material bonded to said segments, said annulus including a slot extending along one radius of the annulus and completely through that portion of the annulus intersected by the radius from inner diameter to outer diameter of said portion to render said annulus discontinuous at the loci of the slot, said slot being disposed in alignment with one given junction between any two adjacent said segments whereby said locking member may be deformed and inserted through said oil port into said vessel and may thereafter be spread and mounted over said plug between said flange and said sealing ring, and clamp nut means threadedly engaging said threaded portion of said plug and urged against the exterior surface of said vessel surrounding said oil port whereby said locking member is clamped between said flange and the interior surface of said vessel surrounding said port.

4,347,872

AIR WEFT INSERTION SYSTEM

Charles W. Brouwer, East Greenwich, R.I.; H. Gary Osbon, Kalamazoo, Mich., and Karl W. Wueger, Wakefield, R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Aug. 6, 1979, Ser. No. 64,180
Int. Cl.³ D03D 47/30
U.S. Cl. 139—435 **50 Claims**



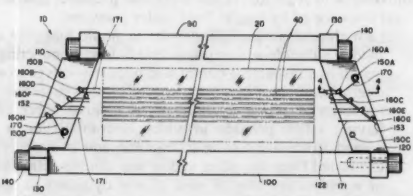
1. A method of inserting a weft strand into the shed of a weaving machine comprising the steps of providing a nozzle in proximity to the shed and serving as guide for a weft strand passing therethrough, and abruptly expelling from said nozzle at a supersonic velocity a sustained pulse of a gaseous medium, said pulse being directed toward said shed into the atmosphere ambient thereto to thereby project the weft strand through at least a portion of the shed, said medium being supplied to said nozzle at an operating pressure having a ratio to the pressure of the ambient shed atmosphere of at least about 2.7:1.

4,347,873

FIXTURE FOR MAKING AN ASSEMBLY OF FINE WIRES

Bernard Caras, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 7, 1980, Ser. No. 166,059
Int. Cl.³ H01J 9/14
U.S. Cl. 140—71.5 **3 Claims**



1. A fixture for forming an assembly of wires on a support plate comprising

a frame having a longitudinal axis including upper and lower bars and left and right side bars, all of the bars being secured together and defining an open space between them,

first and second groups of pins on said side bars and spaced from each other so that a wire can be wound around said pins and between the pins of each group to form the desired individual wires oriented generally parallel to said axis, the pins of each group being disposed on a line oriented at an angle to said longitudinal axis, and

a plurality of binding pins on said frame to which the ends of a winding wire can be secured, said binding pins having such a cross-section that the binding pins have a sharp edge which secures the wire in place when it is tightly wound around the pin.

4,347,874

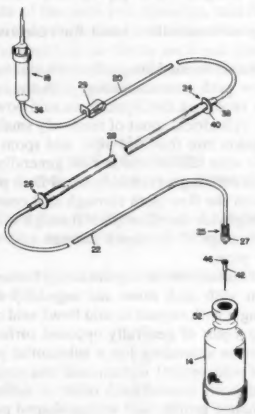
HIGH SPEED STERILE FLUID TRANSFER UNIT

James J. Sullivan, 1329 N. Foothill Rd., Ojai, Calif. 93023, and Charles M. Grey, 1518 Conestoga Ct., Redlands, Calif. 92373

Filed Oct. 2, 1980, Ser. No. 193,364

Int. Cl.³ B65B *3/12*

U.S. Cl. 141—1 **12 Claims**



1. A high speed sterile transfer unit for steriie fluids, for use with peristaltic type pumps, comprising:

a large diameter flexible silicone rubber tube having an outer diameter in the order of one-third of an inch, and being approximately one foot long and of sufficient length to serve as the active flexible conduit of a roller-type peristaltic pump;

input and output small diameter plastic tubes each being in the order of one and one-half feet or more in length, and the diameter of said tubes being less than one-half that of said rubber tube;

first and second plastic fitting means cemented to the said input and output piastic tubes and having an interference fit with both of the opposite ends of said silicone rubber tube, each of said fittings having a substantial overlapping area with each of said tubes;

a large vented input spike cemented to the other end of said input plastic tube for receiving input fluid;

a threaded fitting cemented to other end of said output plastic tubing for attachment to a fluid dispensing fitting;

a shutoff clamp valve enclosing one of said plastic tubes;

said entire assembly as defined hereinabove being secured together as a single sterile unit; and

peristaltic pump means for pumping fluid through said assembly at a rate of 50 cc's in less than ten seconds.

4,347,875

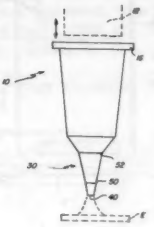
SELF-CLEANING NOZZLE CONSTRUCTION FOR ASPIRATORS

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,789

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—18 **18 Claims**



12. A container for aspirating, storing and dispensing liquid, the container comprising

a compartment having a storage capacity for the total liquid to be aspirated and dispensed, and

a nozzle in fluid communication with said compartment and comprising

a liquid-confining wall wrapped around a longitudinal axis and terminating in a liquid-dispensing orifice,

said wall further including

(a) an interior surface,

(b) an exterior surface having a portion adjacent to said orifice that is adapted to be immersed into a source of the liquid during aspiration, and

(c) means at predetermined loci for attracting liquid remaining on said adjacent exterior surface portion after aspiration, said loci being spaced from said orifice a distance that is between about 0.02 cm and about 0.5 cm,

whereby liquid remaining on said exterior surface is attracted to said loci away from said orifice and does not interfere with the dispensing of the aspirated liquid.

4,347,876

HANDLING AND/OR TREATMENT OF PARTICULATE MATERIALS

John H. Morgan, Syston, England, assignor to Richards Structural Steel Co., Ltd., Leicester, England

Filed Jul. 16, 1980, Ser. No. 169,343

Claims priority, application United Kingdom, Jul. 19, 1979, 79/25126

Int. Cl.³ B65B *1/30, 31/00*

U.S. Cl. 141—70 **3 Claims**

1. An apparatus for the handling and/or treatment of particulate materials, comprising:

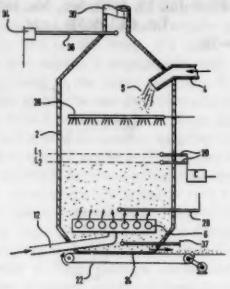
a vessel having a gas outlet flue and a material inlet at an upper region thereof, said inlet allowing entry of particulate material which is to be passed in at an at least substantially downward direction through the vessel, means for passing pressurized gases upwardly through the vessel towards said gas outlet flue, and a second outlet adjacent to a base portion of said vessel;

a discharge conveyor having an upper run positioned to receive material discharging from said second outlet;

sensing and signalling means arranged for sensing the height of fluidized material in said vessel at a predetermined maximum level and a predetermined minimum level and for generating a signal relative thereto, respectively; and

control means adapted to receive said signals and to operate said discharge conveyor to allow discharge of the particulate materials when a signal is received that the maximum level has been reached, and to cause said discharge to

cease when a signal is received that the minimum level has been reached, wherein said upper run of the discharge conveyor passes in such close proximity to said second



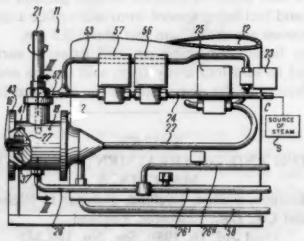
outlet that when, in operation of the apparatus, the conveyor is halted, said second outlet is effectively closed by the presence of the discharged material on said conveyor upper run.

4,347,877

APPARATUS FOR ASEPTICALLY DISCHARGING FLOWABLE SUBSTANCES

Jakob Hoiss, Waldhornstrasse 31, D-8000 München 50, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,252
Int. Cl.³ B08B *3/00*; B65B *3/04*; F16K *51/00*
U.S. Cl. 141—91 **18 Claims**



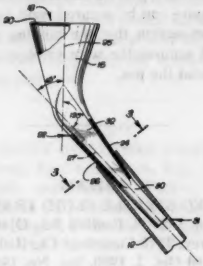
1. An arrangement for aseptically discharging a flowable substance, especially such which has been sterilized in a sterilizing container, into a sterilized conduit, comprising an output duct for the flowable substance having an output end; a discharge valve arranged at and communicating with said output end of said duct and including a valve housing bounding a chamber and inlet and outlet ports for the flowable substance, and having valve seats surrounding said ports, and a valve member received in said chamber and having a surface located on an imaginary sphere and sealingly contacting said seats, and a through passage having inlet and outlet ends, said valve member being rotatable between an open position in which said ends of said passage respectively register with said ports, and a closed position; means for coupling said discharge valve to the sterilized conduit, including a tubular coupling member mounted on said valve member in communication with said outlet end of said passage and having a portion extending beyond the latter and terminating within the confines of said imaginary sphere; and means for admitting sterilizing medium between said valve housing and said valve member at the region of said coupling member.

4,347,878

FUNNEL

Miles E. Schofield, 5949 Melvin Ave., Tarzana, Calif. 91356

Filed Jul. 11, 1980, Ser. No. 167,646
Int. Cl.³ B65B *39/04*
U.S. Cl. 141—300 **4 Claims**



1. A funnel for receiving a poured liquid, and for guiding the liquid into an elongated filler pipe for flow into a receptacle, comprising:

a relatively wide-mouthed bowl for receiving the poured liquid;

a central section formed integrally with said bowl and defining a flow path communicating with the interior of said bowl for receiving the liquid from said bowl; and

a generally cylindrical spout of relatively small cross section for reception into the filler pipe, said spout being formed integrally with said central section generally opposite said bowl, and defining a relatively small flow path communicating with the flow path through said central path communicating with the flow path through said central section for passage of the liquid through said spout and into the filler pipe;

said central section and said spout being formed generally in alignment with each other and angularly disposed at an obtuse angle with respect to said bowl, said central section including a pair of generally opposed surfaces of arcuate cross section extending for a substantial portion of the length of said central section and converging gradually from said bowl toward each other to define a generally wedge-shaped profile, said wedge-shaped profile being of sufficiently small cross section at its end adjacent said spout for reception at least partially into the filler pipe with said opposed arcuate surfaces in binding engagement with the filler pipe and with the end of said spout opposite said central section in abutting engagement with the interior of the filler pipe, said central section further including at least one relatively flat side extending between said opposed arcuate surfaces to define an air vent between the exterior of said central section and the filler pipe when said central section is received partially into the filler pipe.

4,347,879

BOTTLE NECK COUPLING DEVICE

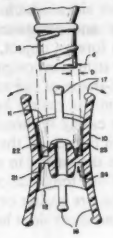
Anton J. Blaser, 700 E. Mason St., Santa Barbara, Calif. 93103

Filed Mar. 27, 1981, Ser. No. 248,463
Int. Cl.³ B15B *3/06*
U.S. Cl. 141—364 **1 Claim**

1. A bottle neck coupling device for receiving in opposite ends the neck end openings of two bottles respectively and holding them in axial alignment so that one bottle can have its ingredients transferred to the second bottle by standing the one bottle upside down on top of the second bottle with their neck end openings held by said device, said device comprising, in combination:

an outer annular body having integrally formed flexible fingers extending from opposite peripheral ends and a central partition;

a tube section coaxially supported by said central partition at its mid portion so as to extend on either side of said partition within said body, said tube section having an outside diameter less than the inside diameter of said body to define an annulus therebetween on either side of the partition for receiving said neck ends of said bottles, the opposite ends of said tube section being received in the inside of the neck end openings and the annular body surrounding the outside of the neck end openings, said flexible fingers serving to hold the bottles in their mounted positions, said tube section holding the bottle neck end openings in coaxial alignment so that ingredients are transferred through said tube section by gravity.



4,347,880

TREE TRIMMERS

Jacobus C. van der Merwe, 144 Kerk St., Nylstroom, Transvaal, South Africa

Filed Dec. 15, 1980, Ser. No. 216,782

Claims priority, application South Africa, Nov. 28, 1979, 79/6454

Int. Cl.³ B26B *15/00*; B27L *1/00*

U.S. Cl. 144—2 Z **3 Claims**

1. A tree trimmer comprising:

a pruning head adapted to be operated by a reciprocable rod to perform a cutting action and to open up;

a double acting compressed air operated linear thrustor having a casing and an actuating rod which is caused to reciprocate;

a standpipe composed of a series of tubes detachably and rigidly screwed together and interposed between the casing and the pruning head; each tube being formed at one end as a solid plug having a guide hole therein; and

a series of connecting rods passing through the guide holes and detachably and rigidly screwed together, the series of connecting rods being connected at one end to the actuating rod and at the other end to the reciprocable rod.

4,347,881

WOOD SPLITTING APPARATUS

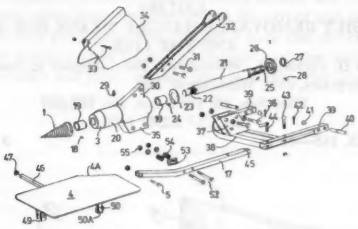
Ian W. Wickham, Junction Rd., 7.R.D., Inglewood, New Zealand; Maxwell J. Till, New Plymouth, New Zealand, and Ernst Forster, Inglewood, New Zealand, assignors to Ian Wallace Wickham, Inglewood, New Zealand

Filed Oct. 2, 1980, Ser. No. 193,115

Claims priority, application New Zealand, Oct. 4, 1979, 191748

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—194 **5 Claims**



1. Apparatus for splitting blocks of wood comprising:

a rotatable block-splitting threaded cone mounted on a stationary mounting,

framework connected with said mounting for supporting said mounting,

a block-supporting platform mounted on said framework and positioned below and to one side of said cone,

said cone, said platform and said framework defining a path of travel along which a block of wood can move while being split, said path of travel being unobstructed beyond the stationary mounting, and

said mounting including bevel means for transferring the pressure tending to restore a split block to its original condition from said cone to said mounting as the split block moves from the base of the cone to said mounting.

4,347,882

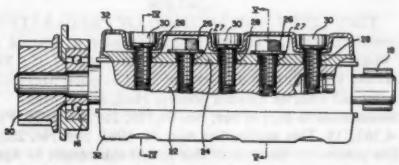
CUTTERHEAD FOR A POWER PLANER

Rainer Bachmann, Hohenstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 7, 1980, Ser. No. 194,833

Int. Cl.³ B27C *1/10*; B27G *13/04*

U.S. Cl. 144—225 **12 Claims**



1. A rotary cutterhead for a power planer, comprising:

an elongated core;

a pressure plate mounted on the core to define a cantilever portion of said pressure plate, said cantilever portion conjointly defining with said core a longitudinally extending slot-like opening for replaceably receiving a cutting blade;

positioning means for allowing positioning of said pressure plate relative to said core at a chosen location to enable

the cutting edge of the cutting blade to project a predetermined amount beyond the cutting circle defined by said rotary cutterhead;

fixing means for fixing said pressure plate to said core at said chosen location without clamping said cutting blade in said slot-like opening whereby said cutting blade can be easily inserted in and withdrawn from said slot-like opening with said pressure plate so fixed in position; and

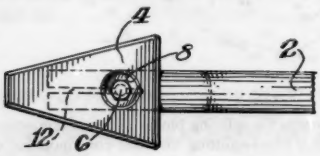
clamping means, independent of said fixing means and operable between said core and said pressure plate, for clampingly loading said cantilever portion to bias the latter towards said core and tightly clamp said blade between said cantilever portion and said core.

4,347,883

EASILY REMOVABLE HANDLE MEANS FOR AXES AND THE LIKE

James D. Fariss, Jr., Wilmington, Del., assignor to Innovation Enterprises, Inc., Wilmington, Del.

Filed Sep. 19, 1980, Ser. No. 188,609
Int. Cl.³ B25G *1/00*
U.S. Cl. 145—61 R **3 Claims**



1. A tool such as an axe, maul, sledge, hatchet, hammer and the like comprising:

a head for cutting or hitting, and

a wooden handle for said head having a slot at one end thereof, this end being insertable into a first opening extending into said head in a direction substantially parallel to the cutting or hitting edge of said head, and

means for detachably affixing said handle to said head comprising a lag screw type fastener extending into a second opening in said head, this second opening extending from the rear or butt end of said head in a direction substantially perpendicular to the cutting or hitting edge of said head, and oriented such that said lag screw is directed through said slot, said lag screw having a diameter large enough for the screw threads thereof to engage and expand the wooden sides of said slot, thereby doubly securing said tool head to said handle and providing for detachment of head and handle by removing the lag screw.

4,347,884

TIRE LINER AND METHOD OF PREPARATION

Donald R. Price, Lansing, Mich., assignor to Harold Harry Vischer, Brooklyn; Harold Harrison Vischer, Jr.; Michael Louis Vischer, both of Jackson; Ian Campbell McLeod, Lansing and Charles Edward Sherry, Holt, all of, Mich.

Continuation-in-part of Ser. No. 51,720, Jan. 25, 1979, Pat. No. 4,262,719. This application Apr. 13, 1981, Ser. No. 253,102
The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.
Int. Cl.³ B60C *17/00*
U.S. Cl. 152—158 **10 Claims**

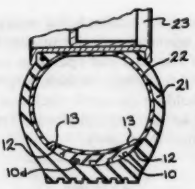
1. In an annular shaped tire liner adapted to fit around and in contact with the inside of a casing which is part of a pneumatic tire and around and in contact with the outside of an inner tube for the tire so as to be between the inner tube and the casing and to be vulcanized to the inside of the casing without an inner tube to reduce the frequency of flat tires wherein the casing has a generally U-shaped surface inside and wherein the tire has spaced apart annular sidewalls supporting a tread the improvement which comprises:

an annular strip of high temperature and pressure molded and vulcanized rubber with two opposite long sides and two opposite short sides,

wherein the strip has a width defined by the two opposite long sides and a thickness along the length between the two opposite short sides which provides for substantial protection against and resistance to penetration of the inside casing by a foreign object,

wherein the annular strip is in compression by the casing and is bent into the U-shape of the casing adjacent the tread when positioned in the casing by the inner tube and by vulcanizing to the casing without an inner tube and tends to straighten when outside of the casing thus holding the liner in position in the casing in use, and

wherein a portion of one long side of the strip which is to be in contact with the tire casing or the inside of the casing adjacent each of the short sides has tapered edges into the short sides.



7. In the method of forming an annular shaped tire liner from a high temperature and pressure molded and vulcanized rubber strip adapted to fit around and in contact with the inside of a casing which is part of a pneumatic tire and around and in contact with the outside of an inner tube for the tire so as to be between the inner tube and the casing and to be vulcanized to the inside of the casing without an inner tube to reduce the frequency of flat tires wherein the casing has a generally U-shaped surface inside and wherein the tire has spaced apart annular sidewalls supporting a tread the improvement which comprises providing a strip of the rubber having generally four sided cross-section such that there are two opposite long sides and two opposite short sides; and bevelling at least the long side of the strip to be adjacent the tread of the tire casing or the inside of the casing with a rubber cutting means into the short sides wherein the strip provides substantial protection against and resistance to penetration to the inside of the casing through the tread by a foreign object and wherein the strip is in compression in the casing and is bent in the U-shape of the inside of the casing and tends to straighten outside of the casing.

4,347,885

ROLLER BLIND STRUCTURE

Enar S. von Knorring, 38 Varkevagan, 770 20 Soderbarke, and Torsten F. Swensson, 76 Vastmannagatan, 113 26 Stockholm, both of Sweden

Filed Nov. 16, 1979, Ser. No. 95,039
Claims priority, application Sweden, Nov. 16, 1978, 7811856; Apr. 27, 1979, 7903741; Sep. 4, 1979, 7907364
Int. Cl.³ E06B *9/206*
U.S. Cl. 160—242 **4 Claims**

1. A roller blind structure comprising:

(i) two spaced apart brackets each having an elongated opening, one of said brackets having an elongated locking surface substantially parallel to its elongated opening,

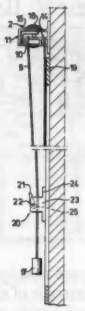
(ii) an elongated roller having at each and an axially projecting stud rotatably and displaceably engaged in a said elongated opening of a respective bracket, said roller having one end of a screen secured thereto,

(iii) a pulley secured to said roller and having a hub between two flanges,

(iv) a cord secured to the hub of the pulley and wound upon said hub in the direction opposite to the direction in which the screen is wound on the roller,

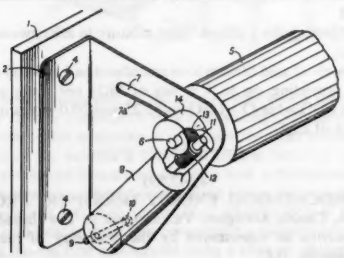
(v) a sleeve rotatably receiving at least one of said flanges of said pulley and including an opening permitting passage of said cord there through, said sleeve including an axial projection disposed to abut and slide along said locking surface of said one bracket for preventing rotation of said sleeve relative to said bracket,

(vi) a guiding and locking member for guiding said cord



relative to said opening of said sleeve and for locking said cord in any desired condition of being wound on said hub, said guiding and locking member being located at a spacing below said sleeve and comprising a manually-actuatable resiliently-loaded locking arm arranged to press said cord against a body portion of said guiding and locking member such that the cord may be pulled past the arm in the direction to wind up said screen on said roller, but such that said cord is locked against movement in the opposite direction until said arm is moved against its loading to free the cord.

4,347,886
ROLLER BLINDS
Enar S. von Knorring, 77020 Saderbarke, Sweden
Filed May 30, 1980, Ser. No. 154,702
Int. Cl.³ E06B *9/20*; A47H *1/00*
U.S. Cl. 160—242 **2 Claims**



1. A roller blind comprising:

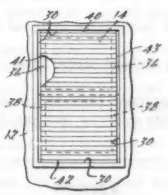
(i) a pair of brackets, for mounting on a support structure each bracket including an arm with an elongated slot therein, the brackets each being such that when they are mounted on the supporting structure the slot extends in the direction away from the support structure,

(ii) a roller, to receive a screen, having a respective trunnion extending axially from each end of the roller, each said trunnion being engaged through the slot of a respective one of the brackets and bearing frictionally on an edge bounding the slot,

(iii) a screen having an end thereof secured to said roller,

(iv) reversing motor drive means connected to one of said brackets and to the roller for rotating said roller, the screen being wound onto the roller in the direction such that rotating of the roller in the direction to lower the screen causes travel of the trunnions along the respective slot to bring the screen nearer to the support structure, and rotation of the roller in the direction to raise the screen causes travel of the trunnions along the respective slot to move the screen farther away from the support structure, wherein the reversing motor drive means comprises an electric motor mounted by a pivot on said one bracket and having a drive shaft drivingly connected to the adjacent trunnion, said slot being arcuate and the axis of said pivot being concentric with the axis of said arcuate slot, said pivot providing clearance such that the respective trunnion rests by its own weight, and the weight of the roller and blind, on said edge bounding the slot.

4,347,887
THERMAL SHUTTERS
Lawrence P. Brown, 760 Gibbs Dr., Ithaca, Mich. 48847
Filed Oct. 6, 1980, Ser. No. 194,135
Int. Cl.³ E06B *3/00*
U.S. Cl. 160—368 R **7 Claims**



1. In a window assembly having a sash portion with glazing therein and a casing surrounding said sash portion, the improvement comprising a thermal insulating system having:

a continuous single sheet of relatively compliant material bonded to itself at spaced intervals to form a plurality of adjacent elongated cells arranged in a double row configuration and disposed adjacent to but spaced from said sash portion on said casing, said double row of elongated cells having generally coplanar outer portions collectively forming a pair of generally parallel outer thermal insulating members and having coplanar inner portions collectively forming a common intermediate thermal insulating member spaced between and generally parallel to said outer thermal insulating members, thereby providing a quadruple glazing insulating effect with the glazing in said sash portion,

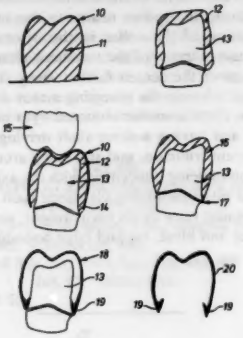
attachment means for securely affixing said formed continuous single sheet to said window assembly on said casing, said attachment means including batten means fixedly secured to said casing for fixedly pressing and sealingly affixing the edge portions of said formed continuous single sheet between said batten means and said casing thereby reducing infiltration through said window assembly and providing a double row of insulative dead air spaces within said elongated cells over the full area of said window assembly.

4,347,888

METHOD OF MAKING FORMS FOR INVESTMENT CASTING AND PRODUCTS PRODUCED THEREFROM

Melvyn P. Butler, Derby, England

Filed Mar. 20, 1980, Ser. No. 132,296
Int. Cl.³ B22C *7/02*
U.S. Cl. 164—34 **17 Claims**



1. A method of making a form of a desired shape, for use in an investment casting technique which comprises:

(a) forming a first sheet of formable material to a shape which approximates to the desired shape of the form;

(b) disposing the formed shape around a layer of deformable hardenable material;

(c) applying a compressive force to the formed shape to deform the underlaying hardenable material to a desired shape;

(d) hardening the hardenable material to produce a form precursor;

(e) removing the formed shape from the hardened form precursor; and

(f) utilizing the hardened form precursor to form a second sheet of formable material into the form of the desired shape.

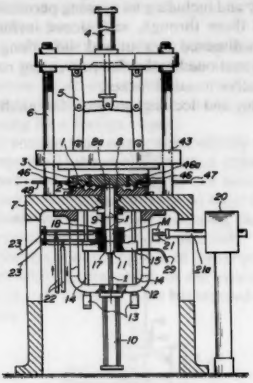
4,347,889

DIECASTING APPARATUS

Mikiya Komatsu; Shunsuke Suzuki, both of Yokohama, and Takasumi Maruyama, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 3, 1980, Ser. No. 109,394
Claims priority, application Japan, Jan. 9, 1979, 54/366
Int. Cl.³ B22D *17/00*
U.S. Cl. 164—250.1 **6 Claims**

1. A vertical diecasting apparatus comprising a diecasting cavity, a vertically arranged injection cylinder having its upper end in communication with said cavity, a melt chamber cylinder coaxially located below said injection cylinder and having an inner diameter substantially the same as said injection cylinder, a base member adapted for vertical movement, means for moving said base member, said melt chamber cylinder being secured to said base member for movement therewith toward and away from said injection cylinder, so that when said base member is lowered, the melt chamber cylinder is spaced apart from the injection cylinder to provide a space for supplying the material to be melted, a movable plunger adapted to pass through said melt chamber cylinder and said injection cylinder to form a melt chamber defined by an upper surface of said plunger and an inner surface of said melt chamber cylinder, said melt chamber cylinder in abutment with said injection cylinder and said cavity all forming a hermetically closed space, and heating and melting means comprising a high frequency induction coil and a resistance heating body arranged about said melt chamber cylinder for melting a solid material inserted therein to be injected into said cavity when melted, said resistance heating body arranged between said coil and said melt chamber for preheating said melt chamber to mitigate rapid heating by said coil, wherein said melt chamber



is a ceramic material composed of at least one material selected from high grade furnace materials of alumina, silica and zirconia ceramics and carbide and nitride materials.

4,347,890

METHOD FOR BINDING PARTICULATE MATERIALS

Iris B. Ailin-Pyzik, Norristown, and James S. Falcone, Jr., Devon, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Filed Mar. 9, 1981, Ser. No. 241,877
Int. Cl.³ B28B *7/34*
U.S. Cl. 164—528 **9 Claims**

1. A method of binding particulate materials, comprising the steps of:

(a) agitating said particulate material;

(b) adding a solution containing lithium ions, said solution being free of chemical species that gel sodium silicate solutions;

(c) mixing for a period sufficient to provide a uniform damp mixture;

(d) adding a sodium silicate solution and mixing for a period of time sufficient to provide a uniform mixture;

(e) shaping the uniform damp mixture to the desired shape; and

(f) subjecting the uniform damp mixture to microwave radiation;

the amounts of said lithium ions calculated as Li_2O and sodium silicate providing up to 4 moles of SiO_2 per mole of M_2O wherein $M_2O = Na_2O + Li_2O$ and 1.25 and 20.0 moles of Na_2O per mole of Li_2O.

4,347,891

THERMOCHEMICAL ENERGY TRANSPORT PROCESS

Talbot A. Chubb, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

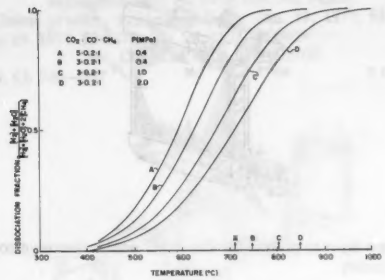
Filed May 6, 1980, Ser. No. 147,412
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—1 **6 Claims**

1. A method of transporting thermal energy from a source of heat to a place of use comprising:

reacting, at a temperature of at least 700° C., a gas mixture of CO, CO_2 and CH_4, having a CO_2/CH_4 mole ratio of 2.0–7.0 and a CO/CH_4 mole ratio of 0.0–0.4, in the presence of a first catalyst to produce a reformed gas mixture of primarily CO_2, H_2, CO and H_2O;

transporting said gas mixture to said plate of use;

reacting, at a temperature of about 600° C. or less, said reformed gas mixture in the presence of a second catalyst to produce a substantially methanated gas mixture and thermal energy;



cooling and pressurizing said methanated gas mixture;

transporting said methanated gas mixture to said source of heat; and

repeating the series of steps set forth above.

4,347,892

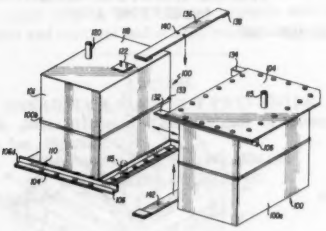
ENERGY STORAGE UNIT AND SYSTEM

Arthur J. Clyne, Alma; John E. Knarr, Lansing, and Stanley Miller, Alma, all of Mich., assignors to Energy Recycling Company of Michigan, Lansing, Mich.

Continuation-in-part of Ser. No. 938,543, Aug. 31, 1978, which is a division of Ser. No. 773,714, Mar. 2, 1977, Pat. No. 4,127,161. This application Mar. 4, 1980, Ser. No. 126,933

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—10 **16 Claims**



1. A heat storage unit of the type in which heat from a heat transfer fluid is transferred to a heat storage substance when the transfer fluid temperature is greater than the melting temperature of the substance such that heat is stored in the substance as heat of fusion and wherein heat is transferred from said substance to a heat transfer fluid when the transfer fluid temperature is less than the melting temperature of the substance, said heat storage unit comprising a substantially closed housing having first and second ends; a closure element forming substantially one entire end thereof; a fluid inlet and outlet at said respective first and second ends; at least two planar support means having a plurality of holes therein mounted within said housing adjacent to, and spaced from, each end of said housing; and a plurality of elongated, cylindrically-shaped, heat storage substance containers in said housing, said containers being longitudinally supported within said housing by said two planar support means, and laterally supported by one another; said unit including laterally extending supports for attaching said heat storage unit to an adjacent heat storage unit and a compression retainer plate engageable with lateral supports of an adjacent heat storage unit.

4,347,893

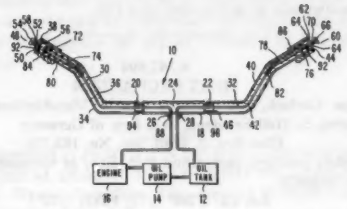
OIL HEATED MOTORCYCLE HANDLEBAR CONSTRUCTION

Donald Moyer, 8105 Millcreek Pkwy., Levittown, Pa. 19054

Filed Apr. 6, 1981, Ser. No. 251,583

Int. Cl.³ B60H *1/14*

U.S. Cl. 165—44 **10 Claims**



1. An oil heated motorcycle handlebar construction comprising:

(a) a central handlebar section extending generally horizontally and including a first end and a second end thereof and being adapted to be secured to a conventional motorcycle, said central handlebar section defining a central conduit therethrough and an oil intake hole and an oil exit hole therein;

(b) a first arm means secured to and extending upwardly and outwardly from said first end of said central handlebar section and defining a first arm conduit therethrough being in fluid flow communication with said central conduit, said first arm means defining an outer first arm end opposite from securement to said central handlebar section;

(c) a second arm means secured to and extending upwardly and outwardly from said second end of said central handlebar section and defining a second arm conduit therethrough being in fluid flow communication with respect to said central conduit, said second arm means defining an outer second arm end opposite from securement to said central handlebar section, said central conduit and said first arm conduit and said second arm conduit being in fluid flow communication to define an oil chamber for heating the motorcycle handlebars;

(d) a first stopper means detachably securable to said first arm end to seal said first arm conduit from fluid flow communication with respect to the external environment;

(e) a second stopper means detachably securable to said second arm end to seal said second arm conduit from fluid flow communication with respect to the external environment;

(f) an intake line means to admit warm oil into said oil chamber which extends through said oil intake hole into said central conduit and through said first end into said first arm conduit to a location adjacent to said outer first arm end and defining an upper intake aperture thereadjacent, said intake line means also defining a lower intake aperture within said first arm conduit at an intermediate location between said first end of said central section and said upper intake aperture;

(g) an exit line means to withdraw warm oil from said oil chamber which extends through said oil exit hole into said central conduit and through said second end into said second arm conduit to a location thereadjacent to said outer second arm end and defining an upper exit aperture thereadjacent, said exit line means also defining a lower exit aperture within said second arm conduit at an intermediate location between said second end of said central section and said upper exit aperture;

(h) a first tubing means removably placcable extending over and along the outer surface of said intake line means to close said lower intake aperture and force all warm oil

being admitted through said intake line means to travel through said upper intake aperture and warm the handlebar construction outwardly to said first arm end; and

(i) a second tubing means removably placeable extending over and along the outer surface of said exit line means to close said lower exit aperture and force all warm oil being exited through said exit line means to travel through said upper exit aperture and warm the handlebar construction outwardly to said second arm end.

4,347,894

HEAT EXCHANGER

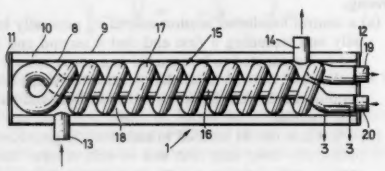
Jürgen Gerlach, c/o Gerlach GmbH Maschinebau, In den Gärten 5, 5140 Erkelenz, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,726

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935626

Int. Cl.³ F28F *9/22*; F28D *7/02*

U.S. Cl. 165—76 **4 Claims**



1. A heat exchanger having a casing (1) and a piping (15) arranged in the casing for the separate flow and heat exchange of media having different temperatures, the casing (1) having an inlet (13) and an outlet (14) for a flowing medium and the piping being a coil (15) having a helical form which is arranged so that a portion of its outer surface rests against the inner wall (8) of the casing, the improvement comprising, the coil (15) having a straight central section (16) and a section running back around it (17) in a helical manner, whereby a helical channel (18) for the passage of a heat exchange medium fed into the inlet (13) and passing out from the outlet (14) is defined by the piping (17) resting against the inner wall (8) and the straight central section (16), thereby increasing the area of heat transfer and also increasing the area on which impurities may condense, the inlet (13) and the outlet (14) each communicating with the helical channel (18), the casing (1) being formed of two horizontally separated sections (4, 5), the upper section (5) being swung away, when desired, to thereby permit the piping coil (15) to be removed from the casing for cleaning, the said coil (15) being formed as a cartridge-like insert both ends of which terminate at one end portion (12) of the casing (1).

4,347,895

HEAT EXCHANGER WITH BILAYERED METAL END CONTAINER FOR ANTICORROSIVE ADDITION

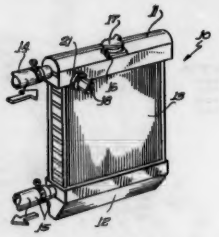
John L. Zambrow, Lincolnshire, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 5, 1981, Ser. No. 222,413

Int. Cl.³ F28F *19/00*

U.S. Cl. 165—134 R **6 Claims**

1. A heat exchanger in combination with a container for the automatic addition of a corrosion inhibitor into a circulating fluid system for the heat exchanger subject to corrosion, including a container housing the corrosion inhibitor with a membrane for one end of said container having an exterior surface exposed to the circulating fluid, said container end comprising a bimetallic membrane having a base metal layer forming the interior surface exposed to the corrosion inhibitor and which will corrode when the circulating fluid has an unacceptable level of corrosion inhibitor, and an imperforate thin film of a second metal formed on the exterior surface of



the base layer to protect the base layer until a corrosive condition occurs.

4,347,896

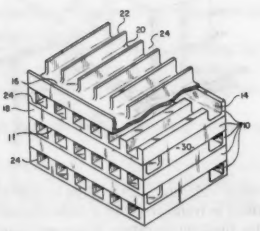
INTERNALLY MANIFOLDED UNIBODY PLATE FOR A PLATE/FIN-TYPE HEAT EXCHANGER

Irwin E. Rosman, Woodland Hills, and William R. Wagner, Los Angeles, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 1, 1979, Ser. No. 80,877

Int. Cl.³ F28F *3/00*

U.S. Cl. 165—166 **13 Claims**



1. A plate for a plate/fin-type heat exchanger, comprising:

an open-faced plate, for channeling a fluid;

a side port transversely oriented through the top edge of said open-faced plate;

means for internally manifolding, wherein said means extend the full width of said plate and is contiguous with said side port;

a closed end lateral with and adjacent to said means for internally manifolding;

a plurality of contact fins and channels for directing fluid flow and for enhancing heat transfer, and wherein said contact fins and channels are contiguous with and transverse to said means for internally manifolding;

an open end port contiguous with said means for channeling; and

a flat bottom for mating with said fins and said open face of an adjacent plate.

4,347,897

PLATE TYPE HEAT EXCHANGER

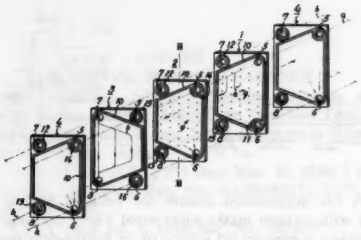
Hiroyuki Sumitomo, Amagasaki, and Haruo Uehara, Saga, both of Japan, assignors to Hisaka Works, Ltd., Osaka, Japan

Continuation of Ser. No. 868,749, Jan. 12, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 94,831

Claims priority, application Japan, Jan. 19, 1977, 52-5270; Jan. 19, 1977, 52-5271; Jan. 28, 1977, 52-9029

Int. Cl.³ F28F *3/00*; B01D *1/00*

U.S. Cl. 165—167 5 Claims



1. A plate type heat exchanger for exchanging heat between first and second fluids, said heat exchanger comprising a plurality of plate assemblies, each assembly including a heat exchange plate to provide heat exchange between said first and second fluids while maintaining separation of said first and second fluids, at least one of said plate assemblies including jet plate means positioned adjacent and parallel to at least one of said heat exchange plates, said jet plate means including a plurality of hole means therethrough, said hole means being distributed on said jet plate means in a selected pattern, wherein said hole means are oriented with respect to said heat exchange plate such that fluid passes through said hole means in only one direction perpendicular to said at least one heat exchange plate only in the direction towards said heat exchange plate and contacts said at least one heat exchange plate.

4,347,898

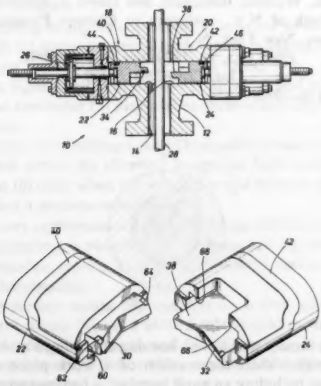
SHEAR RAM BLOWOUT PREVENTER

Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Nov. 6, 1980, Ser. No. 204,451

Int. Cl.³ E21B *29/08*, *33/06*

U.S. Cl. 166—55 10 Claims



1. A blowout preventer comprising

a housing having a bore therethrough,

ram guideways extending outwardly from said bore,

rams mounted for reciprocation in said guideways and having shearing means on their inner faces,

means for moving said rams together to close off said bore and apart to open said bore,

means for sealing between said shearing means,

a shoulder on one of said rams, and

ramp means on the other of said rams adapted to engage said shoulder as said shearing means is moved to closed position whereby said shearing means are urged toward each other to minimize the gap to be sealed by said sealing means.

4,347,899

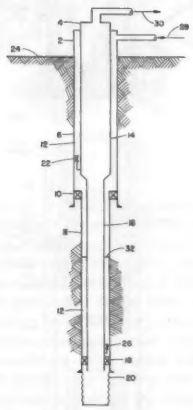
DOWNHOLD INJECTION OF WELL-TREATING CHEMICAL DURING PRODUCTION BY GAS LIFT

Robert F. Weeter, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 218,149, Dec. 19, 1980, abandoned. This application May 28, 1981, Ser. No. 267,301

Int. Cl.³ E21B *43/00*

U.S. Cl. 166—310 14 Claims



1. In the production of oil from an oil well by gas lift operations of the type wherein

(1) recovery gas is introduced into the annular space between a well casing and a tubing string located within said casing, said tubing string provided with at least one gas lift flow valve intermediate the well head and the wellbore bottom, and

(2) gas pressure in the annular space is maintained at a level effective to cause the flow valve to open whereby the recovery gas causes oil to be produced at the well head, the improvement which comprises:

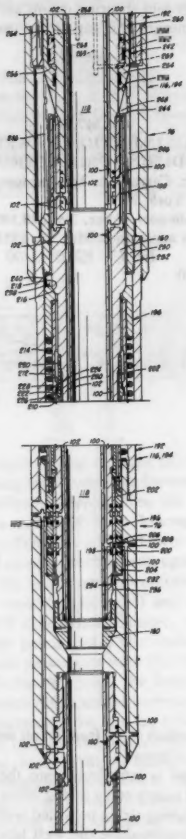
(a) providing a liquid well-treating chemical composition injection valve on said tubing string downhole from the lowermost gas lift flow valve, said well-treating composition injection valve being operatively opened by the pressure difference between the annular space and the tubing string at the location of the well-treating composition injection valve, and

(b) during the oil production of step (2), injecting into the annular space a well-treating effective amount of a liquid, well-treating chemical composition said composition providing a liquid head in the annular space effective to cause the well-treating composition injection valve to open and the well-treating composition to pass into the tubing string.

4,347,900
HYDRAULIC CONNECTOR APPARATUS AND METHOD

Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 13, 1980, Ser. No. 159,285
Int. Cl.[3] E21B *23/04, 34/06, 34/16, 43/12*
U.S. Cl. 166—380 30 Claims

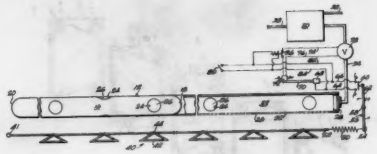


1. A hydraulic connector apparatus, comprising:
a first cylindrical tubular member having a first hydraulic port disposed in a radially outer surface thereof;
a second cylindrical tubular member having a second hydraulic port disposed in a radially inner surface thereof;
a first cylindrical sliding sleeve valve disposed about said first tubular member and movable relative to said first tubular member between open and closed positions wherein said first port is open and closed, respectively;
a second cylindrical sliding sleeve valve disposed within said radially inner surface of said second cylindrical tubular member and movable relative to said second tubular member between open and closed positions wherein said second port is open and closed, respectively; and
interconnecting means, operably associated with said first and second sliding sleeve valves, for moving said first and second sliding sleeve valves to their respective open positions when said first tubular member is inserted in said second tubular member by movement of said first tubular member in a first direction relative to said second tubular member.

4,347,901
FIRE EXTINGUISHING SYSTEM FOR AIRCRAFT

George D. Wilhoit, 4421 Meade Ave., Fort Myers, Fla. 33901

Continuation-in-part of Ser. No. 30,516, Apr. 16, 1979, Pat. No. 4,253,527. This application Feb. 9, 1981, Ser. No. 232,740
Int. Cl.[3] A62C *35/12*
U.S. Cl. 169—62 7 Claims

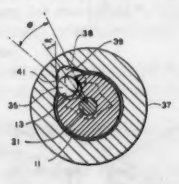


1. A fire suppression system for vehicles having closed cabins with oxygen masks superposed above passenger seats comprising, a pressurized source of an appropriate fire extinguishing material, delivery means for said material supported relative to and about the general length and width of the ceiling of the vehicle compartment, means interconnecting said source to said delivery means including a normally closed valve means; heat responsive sensor means extending about the compartment relative to said delivery means to actuate said fire suppression system, a first normally open electric switch means in a first electric circuit, interconnected between said heat sensor and each existing oxygen mask compartment door in a vehicle in a manner so as to close said first switch permitting the opening of the doors and the automatic discharge of said oxygen masks therein in response to an overheated condition of said heat sensor; a second electric circuit connecting between said valve and a normally open time delay switch which is closed to open said valve after a predetermined time delay period in response to the opening of any one of said doors, to permit a flow of said fire extinguishing material from said source through said interconnection means and valve, and into said delivery means; a plurality of perforations about said delivery means to permit the discharge of said fire extinguishing material through said perforations when the system is actuated.

4,347,902
ROTARY IMPACT WRENCH CLUTCH

William K. Wallace, Barneveld, and David A. Giardino, Deerfield, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Dec. 18, 1979, Ser. No. 104,848
Int. Cl.[3] B25B *19/00*
U.S. Cl. 173—93.5 6 Claims



1. In an impact tool have a housing enclosing a motor means and an output shaft for rotation of a work piece, a clutch mechanism including an anvil member, a hammer surrounding the anvil member, a pin positioned between the anvil member and the hammer, and a coupling member for connecting the

pin with the motor means wherein the coupling member is interengagedly connected to the output shaft at a first end, said coupling member having a semi-circular groove at a second end for receipt of one end of the pin, said anvil being formed with diametrically opposed double-sided cam means which serve to move the pin in a longitudinal slot of the hammer, said anvil having a lug with surfaces arranged for receipt of an impact blow from the hammer by way of the pin.

4,347,903

ELECTRONIC READING BALANCE

Shozo Yano; Toshiyuki Miyake; Yasuhiro Fujinaga; Akira Koomoto; Toshio Kawara; Akio Yagi; Tomohiro Tsuji, and Tadashi Nagaoka, all of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

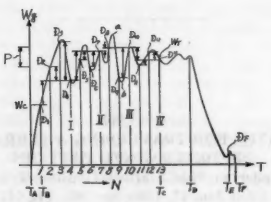
PCT No. PCT/JP79/00178, § 371 Date Mar. 10, 1980, § 102(e) Date Feb. 5, 1980, PCT Pub. No. WO80/00272, PCT Pub. Date Feb. 21, 1980

PCT Filed Jul. 5, 1979, Ser. No. 192,529

Claims priority, application Japan, Jul. 10, 1978, 53/84696

Int. Cl.³ G01G *19/04, 23/10;* **G06F** *7/28*

U.S. Cl. 177—25 **3 Claims**



1. A weighing balance device designed to provide an average weight to a weighed object which moves such as a laboratory animal, comprising, in combination:

(a) balance means **(1)** disposed to receive an object to be weighed and provide an electrical analog output signal corresponding to the weight of the object;

(b) an amplifier **(2)** electrically coupled to said balance means **(1)** so as to receive said analog output signal and convert said analog signal to a value useable by the subsequent circuitry;

(c) an analog-to-digital converter **(3)** coupled to said amplifier **(2)** for receiving said useable signal in analog form and convert it to information in digital form;

(d) data input control means **(6)** coupled to said analog-to-digital converter **(3)** disposed to receive said digital information;

(e) detector level setting means **(7)** coupled to said data input control means **(6)** allowing an output from said control means **(6)** only when the weight on said balance means **(1)** reaches a predetermined level;

(f) memory register means **(8)** coupled to said control means **(6)** including a plurality of registers fed by the digital information passing through said control means to store said information;

(g) comparator means **(9)** coupled on a first side to said control means **(6)**, on a second side to said memory; and also having third, fourth and fifth sides;

(h) allowable range means **(11)** coupled to the third side of said comparator;

(i) sampling time means **(10)** coupled to said fourth side;

(j) average calculating means **(12)** coupled to said fifth side to average the information provided by said comparator; and,

(l) utilization means **(14)** coupled to said average calculator means **(12)**.

4,347,904

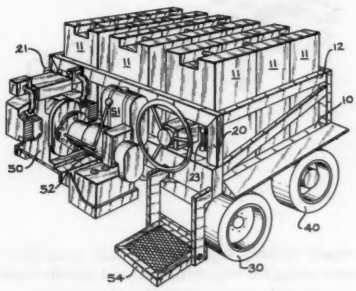
WEIGHT CART CALIBRATION APPARATUS

Glenn G. Dunbar, 2608 Overbrook, Toledo, Ohio 43614

Filed Jan. 21, 1981, Ser. No. 226,723

Int. Cl.³ G01G *19/52;* **G01L** *25/00*

U.S. Cl. 177—50 **11 Claims**



1. A scale testing cart for selectively positioning scale calibration weights on platform scales, comprising in combination:

a bed for retaining a plurality of calibration weights;

a tubular frame positioned at one end of said bed, said tubular frame being adapted for holding a fluid;

a hollow member positioned at the other end of said bed, said hollow member being adapted to retain ballast means;

drive means positioned adjacent said tubular frame, said drive means including a drive engine and gas tank and a hydraulic drive pump for propelling said cart; and

a lift bar positioned substantially at the weight center-line of said cart whereby the fluid in said tubular frame can be varied to balance said cart when said cart is suspended on said lift bar.

4,347,905

TEST WEIGHT SCALE

David H. Berckes, Rte. 3, Box 210, Canby, Minn. 56220

Filed Dec. 8, 1980, Ser. No. 214,277

Int. Cl.³ G01G *19/56, 1/18*

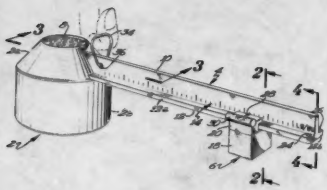
U.S. Cl. 177—149 **10 Claims**

1. A portable, hand held scale for testing the bushel weight of grain comprising:

a cannister of predetermined volume for receiving grain, said cannister having a lower end in the form of a cylinder and an open upper end of generally frustro-conical configuration with inclined side walls forming an angle of less than 45° with the vertical extensions of the cylindrical side walls of said lower end and terminating at the top of said cannister in a grain filling and receiving aperture lying in a horizontal plane when the scale is being used, said conical upper end and said cylindrical lower end being joined together in permanently assembled condition for all weighing opera-

tions, and said filling and receiving aperture comprising a circular opening having a diameter of an order of magnitude between one and two inches, whereby excess grain overflowing the top of said cannister through said circular opening may be struck off level with the top of the cannister with the user's finger;

a slide beam joined to said cannister at one end thereof, said slide beam having weight scale increments marked along its length in a predetermined calibration based on the volume of said cannister, permitting the direct reading of the weight of the grain being tested for a particular volume, such as a bushel;



weight means slidably supported on said beam for sliding movement along the length thereof, said weight means having a weight scale indicating marker thereon; and

pivot support means on said beam located between said cannister and the opposite, free end of said beam, whereby said scale may be suspended from said pivot support means with said cannister filled with grain and said weight means slidably adjusted on said beam until said scale is in a balanced condition with said beam oriented substantially horizontally, the test weight of the grain being indicated by the scale increment with which said marker is aligned.

4,347,906

Patent Not Issued For This Number

4,347,907

ALL-ELECTRIC A.C. TRACTOR

James H. Downing, Jr., Rte. 2, Box 276, Louisa, Va. 23093

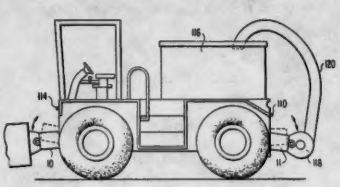
Division of Ser. No. 941,358, Sep. 11, 1978, Pat. No. 4,196,785, which is a continuation-in-part of Ser. No. 769,378, Feb. 16, 1977, Pat. No. 4,113,045. This application Nov. 5, 1979, Ser. No. 91,307

The portion of the term of this patent subsequent to Jun. 28, 1995, has been disclaimed.

Int. Cl.³ B60L *11/08*

U.S. Cl. 180—65 C **1 Claim**

1. A land vehicle having left and right traction means, and comprising a material-transferring tunnel extending from the front to the rear of the vehicle and passing between the two traction means, said tunnel being closed along its length and open at the front and rear ends thereof, and a vertically adjustable tunnel extension hinged at one end of said tunnel, and wherein said left traction means comprises a pair of front and rear left wheels, and said right traction means comprises a pair of front and rear right wheels, and further comprising:



at least one hollow-tubular axle having an enlarged portion in the center thereof for mounting said axle for oscillating movement about said tunnel; and

left and right wheel-driving induction motors mounted within said axle at opposite ends thereof.

4,347,908

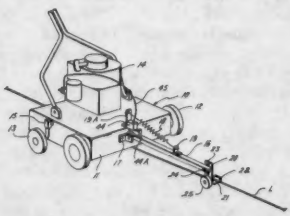
APPARATUS FOR TRAVERSING A TERRAIN IN A PREDETERMINED PATTERN

Ronald L. Anderson, 9034 Marlive, Houston, Tex. 77025

Filed Jan. 17, 1980, Ser. No. 112,941

Int. Cl.³ B62D *1/00*

U.S. Cl. 180—131 **18 Claims**



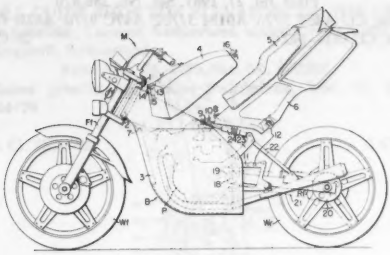
1. Apparatus for traversing a terrain in a predetermined pattern, comprising a self-propelled vehicle, a line adapted to be arranged over the terrain in the desired pattern, means for anchoring the opposite ends of the line to the terrain to hold it tautly when so arranged, means adapted to be anchored to the terrain for yieldably urging intermediate portions of the line downwardly to a position close to the terrain, and upwardly biased follower means attached to the vehicle and having a laterally extending flange which is slidably engageable with the bottom portion of the line, for moving beneath and along the line so as to guide said vehicle in said pattern as it moves over the terrain, and means responsive to upward movement of the follower means relative to the vehicle, in the event of a break in the line, for interrupting the power by which the vehicle is self propelled.

4,347,909

TWO-WHEELED MOTORCYCLE WITH PIVOTABLE SEAT ARRANGEMENT

Hiroo Takemura, Wako, and Azusa Noda, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1980, Ser. No. 167,779
Claims priority, application Japan, Jul. 16, 1979, 54-98243[U]
Int. Cl.³ B62K *11/08;* B60R *11/06*
U.S. Cl. 180—219 4 Claims



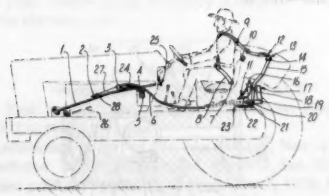
1. In a two-wheeled motorcycle including a shell of thin plates having a head pipe at its front end and being open at its rear side, a rear wheel driving power unit disposed in and fixedly secured to said shell, a rear fork pivotally mounted on said power unit and supporting a rear wheel, a seat stay covering the upper part of said rear wheel and the rear upper portion of said shell, a rider's seat carried on said seat stay, and a shock absorber for damping vertical movements of said rear wheel, the improvement wherein said shell has its rear upper portion formed open, said rear upper shell portion being covered with said seat stay; said seat stay is pivoted at its front end to the rear upper portion of said shell for upward rotation; and said shock absorber is connected between said power unit and said rear fork and covered with said seat stay.

4,347,910

SAFETY APPARATUS FOR VEHICLES

Albert Deguara, C/-Post Office, Rosella, Qld., Australia (4714)

Filed Aug. 25, 1980, Ser. No. 180,906
Claims priority, application Australia, Sep. 25, 1979, PE0639
Int. Cl.³ B60R *21/00*
U.S. Cl. 180—268 7 Claims



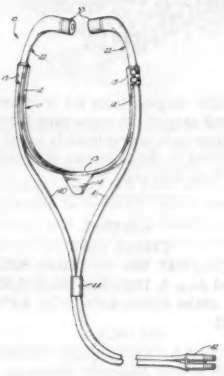
1. Safety apparatus for a vehicle, comprising:
(a) a seat belt or harness adapted to be worn by the operator of the vehicle,
(b) a rigid actuating member attached at a first region thereof to said belt or harness and pivotally mounted at a second, lower region thereof to support means mounted on said vehicle, and
(c) a flexible member attached at one end to said rigid actuating member and connected at its other end to a component or accessory of the vehicle the engagement or disengagement of which controls the movement of said vehicle,
whereby when the operator slumps or makes an unexpected movement of rigid actuating member is pivoted thereby causing movement of said flexible member to engage or disengage said component or accessory.

4,347,911

ACOUSTIC HEADSET

Richard A. Bertagna, San Dimas; Benjamin H. Stansbury, Beverly Hilis, and Kenneth A. Tarlow, Pacific Palisades, all of Calif., assignors to Audio in Motion, Pasadena, Calif.

Filed Mar. 18, 1981, Ser. No. 245,127
Int. Cl.³ A61B *7/02*
U.S. Cl. 181—130 10 Claims



1. An acoustic headset, comprising:
a generally U-shaped flexible yoke having opposed ends;
a pair of hollow sound-conducting rigid horns having first ends adapted for attachment to the respective yoke ends, each horn extending from the first end through a curved portion to a second end adapted to support an ear-plug tip, the first and second ends of each horn having central axes which are displaced by an angle of more than 90 degrees, and each horn having an inside diameter which enlarges as the horn extends from the first end toward the second end;
an acoustic connector having a pair of hollow sound-conducting tubes extending therefrom, the tube ends being connected to the respective first ends of the horns; and
means for mounting the first ends of the horns to the respective opposed ends of the yoke.

4,347,912

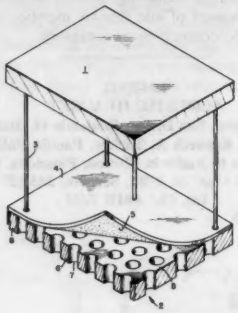
AIRBORNE-SOUND-ABSORBING WALL OR CEILING PANELING

Heinz A. Flocke, and Udo Weuster, both of Weinheim, Fed. Rep. of Germany, assignors to Carl Freudenberg, Hohnerweg, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,696
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1979, 2947607
Int. Cl.³ E04B *1/82;* B32B *3/26, 27/04*
U.S. Cl. 181—286 11 Claims

1. Airborne-sound-absorbing wall or ceiling paneling comprising: a perforated plate having a hole-area proportion L and a nonwoven fabric bonded thereto by a discontinuously distributed adhesive layer and having an open-area proportion N and an air flow resistance W_v in the zones free of adhesive, said perforated plate being mountable at a spacing from a wall or ceiling that is large in relation to the thickness of the nonwoven fabric and said paneling having a total air flow resistance W,

wherein the adhesive layer is applied to the nonwoven fabric in the form of a fine pattern composed of substantially annular, circular and/or elongated partial layers, wherein the thickness of the nonwoven fabric is from 0.1 to 0.5 mm and the partial



layers have a width ranging from 0.1 to 3 mm and that the proportion per unit area of the nonwoven fabric which is not covered with adhesive is approximately equal to its air flow resistance W_y divided by the hole-area proportion L times the desired total air flow resistance W.

4,347,913

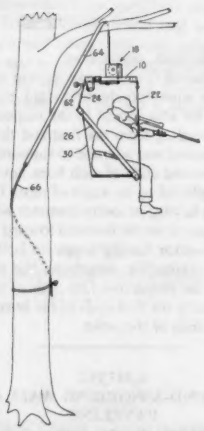
CHAIR LIFT

John A. Cromer, Jr., P.O. Box 597, Aiken, S.C. 29801

Filed Aug. 4, 1980, Ser. No. 175,034

Int. Cl.³ A01M *31/02;* A47F *3/26;* A47C *9/10*

U.S. Cl. 182—142 **4 Claims**



1. A chair lift for use by a hunter and the like for raising a person off the ground by means of a line extending over a support member comprising:

a substantially rectangular rigid frame member;

a seat hung from said frame member;

a gear assembly carried on top of said substantially rectangular rigid frame member;

said gear assembly including,

(i) a rotatable worm,

(ii) a gear meshing with said worm,

(iii) a shaft extending through said gear and being rotated therewith,

(iv) a pulley carried by said shaft;

a coil of line carried on said pulley; and

a hand-operated crank arm connected to said worm and extending downwardly through said substantially rectangular rigid frame member adjacent said seat so that said crank can be manually rotated by an occupant of said seat.

4,347,914

PORTABLE TREE SLING OR PORTABLE TREE STAND OR PORTABLE TREE HUNTING SLING, OR ALTERNATIVES THEREOF

David A. Gary, O'Donald, Tex., assignor to Robert Sims, Brownfield, Tex.

Filed Jul. 27, 1981, Ser. No. 286,870

Int. Cl.³ A45F *3/26;* A01M *31/02;* A47C *9/10;* A62B *1/00*

U.S. Cl. 182—142 **26 Claims**

1. A sling adapted to suspendingly support a seated person above the ground comprising means for defining a flexible seat rest and a separate flexible back rest, means for suspending said sling through a connection at least between said back rest and an associated support, means for defining a foot rest, said foot rest being a rope, and means for joining said rope to opposite sides of said seat rest whereby a person seated upon said seat rest will have his back and feet supported respectively by said back rest and said foot rest rope.

4,347,915

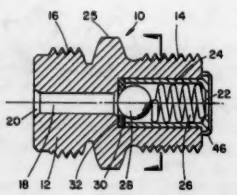
GREASE FITTING

Jack M. Cooper, Houston, Tex., assignor to General Screw Products Company, Houston, Tex.

Filed Feb. 25, 1980, Ser. No. 124,444

Int. Cl.³ F16N *5/02*

U.S. Cl. 184—105 B **7 Claims**



1. A fitting for allowing a lubricant to enter a device and retain said lubricant within said device, comprising:

a body member having a passageway through said body member,

a pliable washer within said passageway having a substantially circular seating surface formed therein,

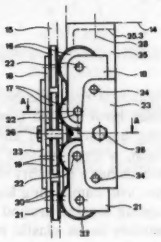
a ball member within said passageway for sealing engagement with said seating surface,
a spring within said passageway biasing said ball member toward said seating surface,
a sleeve member within a portion of said passageway containing said ball member and spring and exerting a predetermined compressional force on said pliable washer, and
a stop on said sleeve member for engagement with said body member for restricting the compressional force exerted on said pliable washer by said sleeve member.

4,347,916

ROLL GUIDE SHOE FOR ELEVATORS OR THE LIKE

Joris Schröder, Lucerne, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Nov. 24, 1980, Ser. No. 210,005
Claims priority, application Switzerland, Dec. 11, 1979, 10964/79
Int. Cl.³ B66B 7/02
U.S. Cl. 187—95 **1 Claim**



1. A roll guide shoe for elevators comprising:
a plurality of travelling rolls arranged behind one another in the direction of travel of the elevator and adapted to bear against at least one guide surface of a guide rail;
at least one support element adapted to be pivotably connected with a movable part of the elevator;
means for rotatably mounting said travelling rolls in said support element;
said travelling rolls of said at least one support element possessing different diameters with respect to one another;
said plurality of travelling rolls comprise four travelling rolls arranged in pairs behind one another in the direction of travel of the elevator part;
each of the pair of travelling rolls having different diameters;
each pair of travelling rolls being operatively associated with a respective support body of a related support element;
yoke means with which there is pivotably connected each related support element; and
said yoke means being pivotably connected with the movable elevator part.

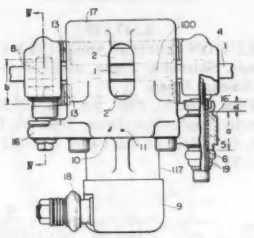
4,347,917

FLOATING TYPE DISC BRAKE

Yasuo Kita, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 854,168, Nov. 23, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,702
Claims priority, application Japan, Dec. 7, 1976, 51-147460
Int. Cl.³ F16D 65/02
U.S. Cl. 188—73.45 **9 Claims**

1. In a floating disc brake of the type having a fixed member having two pairs of arm portions spanning a rotatable disc and displaced from one another about the periphery thereof, first and second friction pads slidably guided by opposing faces of said two pairs of arm portions of said fixed member into and out of pressing contact with opposite faces, respectively, of said disc, a floating caliper member spanning said disc and both of said pads, mechanically activated press means for acting between said second pad and one end of said caliper member, the improvement wherein said floating caliper member is provided with a hole receiving therein a bolt extending in the axial direction of said disc from one pair of said arm portions of said fixed member, said bolt serving as a main guide for supporting the majority of the weight of said floating caliper during sliding movement of the latter and slidably supporting said floating caliper within a range of sliding movement which is entirely on one side of the disc and includes the center of gravity, in the axial direction of the disc, of the floating caliper, and a pin supporting said caliper member only on said one side of said disc and slidingly fitted in a guide slot running in the axial direction of said disc in the other pair of said arm portions of said fixed member, said guide slot slidably supporting said pin within a range of sliding movement which includes the disc but does not include the center of gravity, in the axial direction of the disc, of the floating caliper.

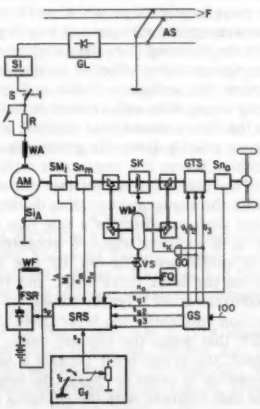


4,347,918

DRIVE DEVICE FOR A VEHICLE

Jean-Jacques Bezencon, deceased, late of Bernex, Switzerland (by Madeleine Bezencon, Corinne Bezencon and Serge Bezencon, heirs); Georges Menzi, Le Lignon, Switzerland, and Lucien Mermoud, Geneva, Switzerland, assignors to BBC Brown, Boveri & Co. Ltd., Baden, Switzerland

Filed Feb. 11, 1980, Ser. No. 120,519
Claims priority, application Switzerland, Feb. 22, 1979, 1176/79
Int. Cl.³ B60K 41/02
U.S. Cl. 192—0.02 R **25 Claims**



1. A drive device for a vehicle, particularly a road or rail vehicle, comprising at least one controllable drive motor and a transmission unit operatively arranged after and coacting with

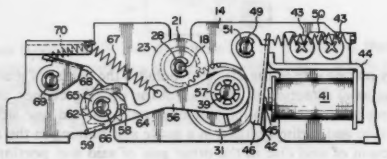
said drive motor, said transmission unit containing an hydrodynamic torque converter, a torque control device operatively connected with said hydrodynamic torque converter, said torque control device comprising a control-variable transmitter controlled in dependence upon a driving condition command, a set-value/actual-value torque comparator with which there is connected said control-variable transmitter, said hydrodynamic torque converter being arranged in circuit after said torque control device and constituting a regulating unit for regulation of the motor torque.

4,347,919

ONE REVOLUTION CLUTCH ASSEMBLY USING GEARS

Katsumi Maeda, Shizuoka, Japan, assignor to Star Seimitsu Kabushiki Kaisha, Japan

Filed Mar. 31, 1980, Ser. No. 135,325
Claims priority, application Japan, Mar. 30, 1979, 54-38593
Int. Cl.³ F16D *11/02*; F16H *27/02, 27/08*
U.S. Cl. 192—33 R **5 Claims**



1. A one revolution clutch assembly comprising:

a drive rotating assembly which is mounted on a continuously rotating drive shaft, the drive assembly including a cylindrical cam having an engaging portion at a point on its peripheral surface, and a drive gear disposed for integral rotation with the cam;

a driven rotating assembly including a driven gear having a hiatus along part of its periphery and disposed for intermittent engagement with the drive gear, and a cylindrical cam follower disposed for integral rotation with the driven gear and having on its peripheral surface means for engaging the engaging portion of the cylindrical cam;

a retainer for retaining the driven gear in position whenever the hiatus of the driven gear is located opposite to the drive gear, the retainer comprising a cylindrical retaining cam coaxially mounted on the driven assembly, and a movable piece having its one end biased by a combination of an electromagnetic plunger and a spring into engagement with the retaining cam, the actuation of the electromagnetic plunger being effective to attract the movable piece against the resilience of the spring, the movable piece being engageable with a detent on the retaining cam to retain the driven assembly in position; and

an engagement guiding device for guiding the cam follower into a position where it is engageable with the engaging portion of the cam when the retainer ceases to retain the driven gear, the engagement guiding device comprising a lever drive shaft mounted on a side face of the driven assembly at a location which is eccentric to the axis thereof, a crank lever having its one end rotatably mounted on the lever drive shaft, and resilient means connected to the crank lever for biasing the crank lever in one direction resiliently, the lever drive shaft being located such that when the retainer ceases to retain the driven gear, the crank lever permits a rotation of the driven assembly in order to engage the means for engaging of the cam follower with the engaging portion of the cam;

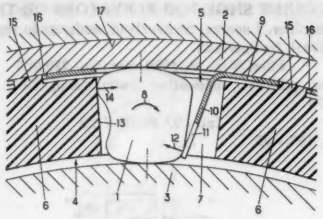
the means for engaging being located such that when it has engaged the engaging portion to permit a rotation of the driven assembly, the drive gear can mesh with a tooth on the driven gear which is located at the terminal end, as viewed in the direction of rotation, of the hiatus.

4,347,920

FREEWHEEL WITH LATERAL RETURN

Alain Bordes, Trappes, France, assignor to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed May 7, 1980, Ser. No. 147,650
Claims priority, application France, May 10, 1979, 79 11918
Int. Cl.³ F16D *41/07*
U.S. Cl. 192—41 A **7 Claims**



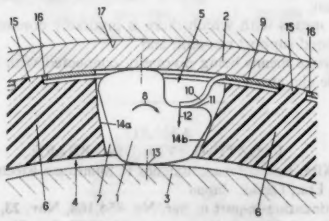
1. A freewheel which is operable between the surfaces of revolution of an outer bush and an inner bush or shaft, said freewheel comprising a plurality of cams for engaging said surfaces of revolution, a cage formed of a single piece of moulded material which has a plurality of roughly rectangular recesses for the cams, said cams being located in said recesses, a continuous strip spring located around the periphery of said cage and being operable as an elastic return means for said cams, said spring having elastic tabs which enter the cage recesses at right angles thereto and bear against the base of the respective cam near the inner bush to exert on it a roughtly tangential thrust, means for fixing said spring member angularly and axially with respect to the cage member, said fixing means including projections on one member which extend into openings on the other member.

4,347,921

FREEWHEEL OR UNIDIRECTIONAL CLUTCH

Alain Bordes, Trappes, France, assignor to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed May 27, 1980, Ser. No. 153,659
Claims priority, application France, May 28, 1979, 79 13494
Int. Cl.³ F16D *41/07*
U.S. Cl. 192—41 A **6 Claims**



1. In a unidirectional clutch comprising an outer bush, means defining a surface of revolution within said bush, an inner member, means defining a surface of revolution on said inner member concentric with said surface of revolution on said outer bush, a plurality of cam profiled jamming elements located between said surfaces of revolution and a cage holding said jamming elements, the improvemen wherein said cage comprises a single integral moulding, means defining recesses in said cage, said recesses each containing one of said elements,

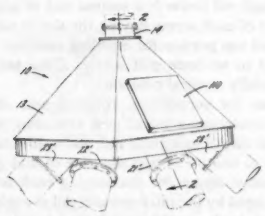
said recesses having sidewalls converging inwardly towards said inner member and said elements having sides adjacent said converging side walls of said recesses converging inwardly towards said inner member, and an integral spring strip extending around said cage between said cage and said outer bush, said spring strip including a plurality of resilient tabs, one of said tabs extending inwardly into each of said recesses, means defining a surface which extends in a substantially tangential direction on each of said elements, said surface being located at one side of said element and said tab in each of said recesses bearing against said surface on said element in said recess to exert upon said surface a substantially radial thrust which is offset circumferentially from a line of contact between said element and said inner member, and further comprising lugs on one of said cage and said spring strip and means defining openings in one of said spring strip and said cage, said lugs fitting in said openings to locate said spring strip circumferentially and axially with respect to said cage.

4,347,922

GRAIN DISTRIBUTOR ASSEMBLY FOR GRAIN ELEVATOR

Robert D. Curry, Decatur; Richard C. Larson, Chicago, and Merle E. Clewett, Clinton, all of Ill., assignors to Union Iron Works, Inc., Warrensburg, Ill.

Filed Oct. 27, 1980, Ser. No. 201,010
Int. Cl.³ B65G *11/00*
U.S. Cl. 193—23 **19 Claims**



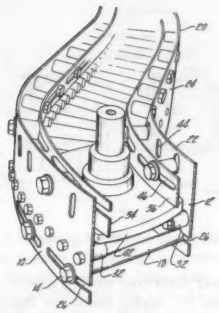
1. In a grain distributor assembly for a grain elevator, the combination comprising a frame including a horizontal manifold plate having a plurality of discharge openings arranged in a circle at a radius about a central axis, each opening having a land surface encircling the same and each opening having an associated downspout connection under the plate, a closure disc superimposed on the manifold plate and having a single window therein located at the same radius for registering with one of the discharge openings for communication with an active downspout, a distributor elbow having an inlet at its upper end arranged coaxially with the central axis and having an outlet at its lower end terminating at the window in the disc, means for feeding grain into the upper end of the elbow for discharge through the registering discharge opening into the active downspout, the land surfaces all being arranged adjacent and parallel to the closure disc so that the inactive non-registering ones of the discharge openings are covered by the closure disc, and selector means for swinging the closure disc and elbow horizontally in unison about the central axis for positioning the elbow and window in angular register with a selected one of the discharge openings while maintaining all of the other such openings covered, the weight of the disc being supported on the land surfaces for sealing off the non-registering ones of the openings, the disc being made of metal and sufficiently weighty so that it remains in position to serve as a fire stop in the face of an explosion either at the distributor inlet or in an inactive one of the downspouts.

4,347,923

GRAVITY CHUTING CONVEYOR

Lungchuck Wong, Warren, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Dec. 5, 1980, Ser. No. 213,567
Int. Cl.³ B65G *11/00*
U.S. Cl. 193—35 S **13 Claims**



1. A gravity chuting system having a plurality of successively connected track sections including at least a downwardly inclined straight track section and a downwardly inclined curved track section, said sections each comprising a pair of upright laterally spaced thin spring tempered metal rails, a plurality of rollers mounted between said rails and forming a supporting and conveying surface for workpieces having flat plate-like portions adapted to rest on the rollers, the rollers at said curved section forming a helically extending work-supporting surface, means for retaining workpieces being conveyed on said track sections against vertical displacement so as to prevent shingling thereof, said retaining means comprising at least one upright, thin, spring tempered metal rail having a lower edge extending above said rollers in generally parallel relation therewith, a support member for supporting said retaining rail on said track sections, releasable fastening means extending through apertures in said retaining rail and said support member, said fastening means, when tightened, being adapted to secure the retaining rail on the track sections in a fixed position, at least some of said apertures being elongated vertically relative to the track sections to permit selective adjustment of the retaining rail vertically at each track section relative to the underlying support surface provided by said rollers before the fastening means are tightened, the vertical spacing between the lower edge of the retaining rail and the underlying support surface being greater at said curved section than at said straight section and being selectively adjusted at each section so as to permit the workpieces to travel freely through said sections on said rollers while simultaneously preventing shingling of the workpieces at both track sections.

4,347,924

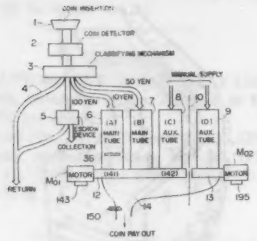
CONTROL SYSTEM FOR A VENDING MACHINE

Yukichi Hayashi; Masayuki Tamara; Osamu Sugimoto, all of Sakado; Masayoshi Takizawa, Kitamoto, and Tatsujiro Nishioka, Yokohama, all of Japan, assignors to Nippon Coinco Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 26,497, Apr. 3, 1979, abandoned, and a continuation-in-part of Ser. No. 790,507, Apr. 25, 1977, abandoned. This application Sep. 23, 1980, Ser. No. 189,988
Claims priority, application Japan, Apr. 30, 1976, 51-49623
Int. Cl.³ G07F *5/24*
U.S. Cl. 194—1 N **11 Claims**

2. A control system of an automatic vending machine comprising main coin storing means, coins stored therein being automatically supplemented by coins inserted into said vend-

ing machine, a counter circuit for adding the number of coins automatically supplemented and for subtracting the number of coins paid out from said main coin storing means, auxiliary coin storing means for storing coins of a predetermined denomination which are supplemented manually, means for paying out coins from said main coin storing means until the count of said counter circuit reaches a predetermined value, means for



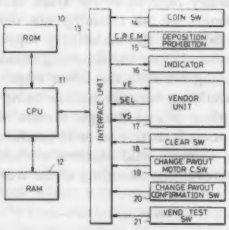
switching from said main coin storing means to said auxiliary coin storing means for paying out coins therefrom when the count of said counter circuit reaches said predetermined value, and means for switching from said auxiliary coin storing means back to said main coin storing means thus paying out coins therefrom when coins are not paid out from said auxiliary coin storing means irrespective of the operation thereof.

4,347,925

MALFUNCTION INDICATION DEVICE FOR A VENDING MACHINE

Osamu Sugimoto, and Masaki Akagawa, both of Sakado, Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 196,072
Claims priority, application Japan, Oct. 16, 1979, 54-143023
Int. Cl.³ G07F *9/02*
U.S. Cl. 194—1 N **6 Claims**



1. A malfunction indication device for a vending machine including means for detecting malfunction in the vending machine characterized by comprising;

malfunction occurrence indication means provided at a prominent place on the outside of the vending machine for indicating occurrence of malfunction if the malfunction has been detected;

memory means for storing codes each representing a malfunctioning point;

an indication control switch; and

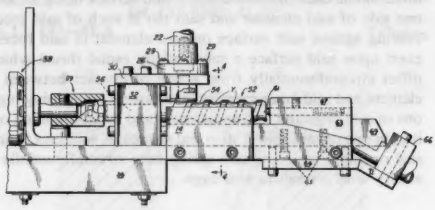
malfunction code indication means for indicating the codes stored in said memory means in response to operation of said indication control switch.

4,347,926

SCREW ORIENTER

William F. Alter, Lexington; Jonathan J. DeBoer, Nicholasville, and Charles R. Shellenberger, Lexington, all of Ky., assignors to Square D Company, Palatine, Ill.

Filed Sep. 22, 1980, Ser. No. 189,255
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—388 **10 Claims**



1. Apparatus for orienting slotted headless screws fed by a feeder bowl, said apparatus comprising;

a guide rail onto which the screws are fed, said rail having a top portion with a width measuring slightly less than the width of the slots in said screws;

means for sequentially moving each screw from said bowl along a predetermined path, with either one end or the other end of each screw forming a leading end in response to the movement, and depositing said screws in a vertical position with said leading end of each screw engaged with said top portion of said rail;

means for supporting, rotating and advancing said screws along said rail towards a second end of said rail to align said slot of each screw having the slot in said leading end with said top portion for enabling said rail to seat in said slot and to advance said screws along said rail in their substantially vertical position,

said means for supporting, rotating and advancing said screws comprises a worm gear extending parallel to and on a first side of said guide rail; and a side shield extending parallel to and on an opposite side of said guide rail;

first discharge means for discharging each screw having a slot engaged by the rail from said rail at a selected position with each leading end having a predetermined orientation; and

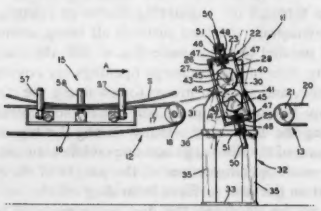
second discharge means for discharging each screw having said slot in said other end at another position.

4,347,927

SHEET ALIGNING APPARATUS

Raymond L. Landes, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jun. 23, 1980, Ser. No. 162,150
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—434 **9 Claims**



1. A sheet aligning apparatus comprising: a frame, a conveyor mounted on said frame for supporting and advancing a

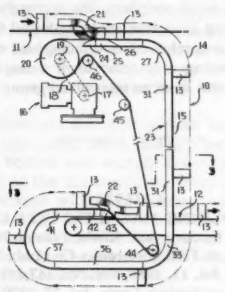
horizontally disposed stacked sheet assembly in a generally horizontal path toward an apparatus having a restricted zone for receiving said sheet assembly, and means along said path immediately upstream of said apparatus for aligning said stacked sheet assembly on said conveyor to guide the leading end of said assembly into said restricted zone, said aligning means comprising a plurality of arms on said frame disposed in an opposed relation on opposite sides of said conveyor, and means moving said arms laterally inwardly into engagement with the opposite sides of said advancing sheet assembly for urging the same in a desired orientation to assure entry of said leading end into said restricted zone, said moving means including means for sequentially swinging one of said arms from an angular position of rest into an upright position and then moving said one arm bodily laterally inwardly into a sheet assembly engageable position.

4,347,928

MAGNETIC CONVEYOR

Russell E. Millspaugh, Downers Grove, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,769
Int. Cl.³ B65G *15/58, 17/46*
U.S. Cl. 198—690 **8 Claims**



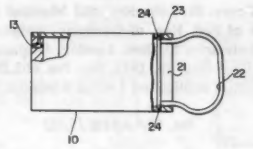
2. A magnetic conveyor for transferring units capable of being magnetized from a first conveyor along a path to a second conveyor wherein said first and second conveyors are positioned at different elevations, said magnetic conveyor comprising conveyor means adapted to be positioned relative to first and second conveyors for carrying units along said path, drive means connected to said conveyor means for imparting movement to said conveyor means, an entrance guide adapted to be positioned to receive units from a first conveyor and deposit the same units directly upon said conveyor means, an exit guide positioned to receive units from said conveyor means and direct the same units to a second conveyor, and support means positioned along said path and engageably underlying a portion of said conveyor means for providing support to said conveyor means portion, said support means exhibiting a magnetic force whereby the units deposited upon said conveyor means portion are magnetically retained on said magnetic conveyor while being transported to said exit guide, said conveyor means and support means lying in a single general plane and including vertically spaced parallel horizontal entrance and exit paths.

4,347,929

BLASTING CAP CONTAINER

Barber S. W. Poe, Piney Point, and Lennard J. Wolfson, La-Plata, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 16, 1980, Ser. No. 160,051
Int. Cl.³ F42B *37/00, 39/00*
U.S. Cl. 206—3 **9 Claims**



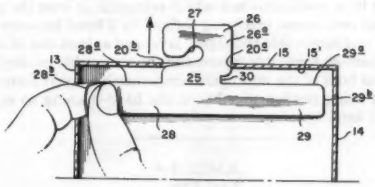
1. An explosive shipping container particularly designed for the shipment and storage of blasting caps comprising: a cylindrical member having a secure base wall, said cylindrical member fitted with a removable door capable of being screwed into the cylindrical member; a shock absorbing means filling substantially the interior of said cylindrical member, said shock absorbing means fitted with a plurality of openings, each opening designed to fit in shock absorbing contact around one blasting cap, said door provided with exterior screw threads designed to fit within the interior upper wall of said cylindrical member, wherein the screw threads on said door are of the square buttress type that engage a buttress type thread located on the interior wall of the cylindrical member, the screw threaded joint between the door and the cylindrical member providing a fluid tight seal that is capable of withstanding high pressure.

4,347,930

HANGING PACKAGE

Lenny Herrin, Elkins Park, Pa., assignor to Regent Paper Box Company, Philadelphia, Pa.

Filed Oct. 14, 1980, Ser. No. 196,375
Int. Cl.³ B65D *25/22, 5/44, 25/54*
U.S. Cl. 206—45.34 **7 Claims**



1. A package adapted to be supported by a hook, comprising: a container having at least first and second sidewalls and a top wall including an aperture, said aperture having first and second ends corresponding to said first and second sidewalls respectively; and a separate hanger assembled with said container, said hanger having a head with an opening projecting above said top wall for engagement by a hook, the maximum widthwise dimension of said head being substantially equal to or less than the lengthwise dimension of said aperture between said first and second ends of said aperture, first and second arms extending away from said head in said first and second directions respectively and engaging the underside of said top wall, said first and second directions corresponding to said first and second sidewalls, the length of said first arm being greater than the distance between said first end of said aperture and

said first sidewall, a notch formed between said head and said second arm adapted to receive a portion of said top wall at said second end of said aperture, said first arm being flexible about a vertical axis and having an outer edge adapted to engage said first sidewall to provide means for urging said entire hanger in said second direction for latching said notch in engagement with said top wall, whereby downward movement of said hanger relative to said container is prevented.

4,347,931

MITT

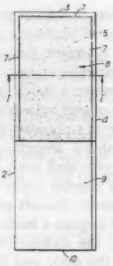
Rodney E. Ginger, St. Leon-Rot, and Manfred Jungesblut, St. Ilgen, both of Fed. Rep. of Germany, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 19, 1977, Ser. No. 862,296

Claims priority, application United Kingdom, Dec. 23, 1976, 53942/76

Int. Cl.³ A61B *19/02*

U.S. Cl. 206—438 **5 Claims**



1. A disposable mitt pack comprising: a bag-like mitt for accommodating the hand of the wearer, said mitt including two overlying layers of impregnant-impermeable material bonded together to form the front and the back of a hand-accommodating region and a hand opening, one of said layers having bonded to its outer surface a porous material, said porous material having a pile on its outer surface impregnated with a desired treating material; and a removable packaging layer of impregnant-impermeable material covering at least the pile area of the mitt so as to protect the impregnated pile until the layer is stripped away, said packaging layer being sealed to the mitt by a continuous seal which surrounds at least the pile area, said continuous seal being formed by a bond between an edge of said removable packaging layer and at least one of said impregnant-impermeable layers, and the removable packaging layer and both of the impregnant-impermeable layers forming the mitt being bonded together at the hand-opening so as to seal said hand opening.

4,347,932

TAG PIN

Akira Furutu, Tokyo, Japan, assignor to Clements Industries, Inc., South Hackensack, N.J. and Japan Bano'k Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 845,961, Oct. 27, 1977, abandoned, which is a continuation of Ser. No. 727,234, Sep. 27, 1976, abandoned. This application Oct. 24, 1979, Ser. No. 87,848

Int. Cl.³ A44B *9/00*; B44D *3/18*

U.S. Cl. 206—343 **7 Claims**

1. A tag pin group comprised of a plurality of integrally molded tag pins formed from a synthetic resin and lying in an aligned row, each said tag pin comprising:

a solid head portion, said head portion including a transverse bar-like projection,

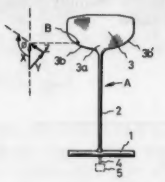
said transverse bar-like projection being positioned approximately mid-way of the longitudinal height of said head portion and coinciding with the largest head width, thereby assuring that the head portion maintains its maximum width, and permitting the use of a relatively thin head portion while preventing deformation of the head portion;

an elongate transverse bar portion having a uniform cross-section;

a filament portion interconnecting said head and transverse bar portions to form a tag pin having a generally H-shape;

a connecting portion extending from said transverse bar portion in a direction away from said filament portion;

a connecting bar connecting each of said connecting portions of said tag pins, wherein said connecting portion and said connecting bar cooperate to form said tag pin group,



said head portion and said transverse bar portion of each tag pin being substantially coplanar and the head and transverse bar portion of each tag pin of said tag pin group lying in substantially parallel planes; and

said solid head portion further including an edge opposite said transverse bar portion, said edge being formed so as to continuously arcuately slope away from said transverse bar portion as it spreads out from the center of the head portion to its outer periphery, the arcuately sloped edge portion forming an obtuse angle with said filament, thus forming a convex release means facing said transverse bar portion permitting easy removal of a single tag pin or group of tag pins from an intermixed group of tag pins.

4,347,933

CASE FOR HOLDING MAGNETIC TAPE CASSETTE

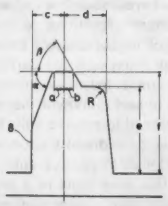
Toshihiko Ishida, Komoro, and Kimio Tanaka, Saku, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1980, Ser. No. 167,411

Claims priority, application Japan, Jul. 17, 1979, 54-97567[U]

Int. Cl.³ B65D *85/67*; B65H *17/02, 75/00*

U.S. Cl. 206—387 **4 Claims**



1. A case for holding a magnetic tape cassette, the case having flat locking projections or tabs upright from the inner wall surface thereof to engage the hubs of the magnetic tape cassette and thereby lock the hubs unrotatably, characterized in that said locking tabs have a uniform thickness and have a step formed in the upper part of each said locking tab.

4,347,934

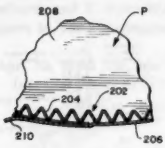
CORRUGATED CONTAINER

James A. Goodman, Glencoe, Ill., assignor to Consolidated Foods Corporation, Deerfield, Ill.

Division of Ser. No. 974,065, Dec. 28, 1978, Pat. No. 4,250,797. This application Oct. 15, 1980, Ser. No. 197,362

Int. Cl.³ B65D *8/04, 3/26, 17/00*

U.S. Cl. 206—633 **12 Claims**



1. A tubular container having a readily removable corrugated side wall comprising:

a corrugated inner sheet having a selected length and width and formed with the lateral ends of said inner sheet that define said length being adjacent each other to define a corrugated tubular inner ply of said container side wall;

a bottom wall member engaged with the lower edge of said corrugated inner sheet and shaped to form the bottom of said container;

a flat outer sheet having a selected length defined by lateral ends and a width defined by axially opposite edges which is greater than the width of the corrugated inner sheet, said outer sheet joined to said corrugated inner sheet to define a tubular outer ply of said side wall, with the lateral ends of said outer sheet adjacent each other and with a portion of said outer sheet projecting beyond said lower edge of said corrugated inner sheet and folded against and secured to said bottom wall member so that said inner sheet and outer sheet cooperate to restrain upward or downward movement, respectively, of said bottom wall member;

said outer sheet and said bottom wall member defining a frangible joint along which said side wall can be severed from said bottom wall without severing said corrugated inner wall, so that the corrugated inner wall adds rigidity to said package without interfering with the ready removal of the side wall from the bottom wall; and

the adjacent lateral ends of said inner sheet being unsealed to one another across said inner sheet which facilitates said removal of said side wall.

4,347,935

METHOD AND APPARATUS FOR ELECTROSTATICALLY SORTING BIOLOGICAL CELLS

John T. Merrill, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

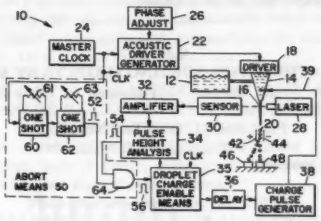
Filed May 16, 1979, Ser. No. 39,527

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—3.2 **5 Claims**

1. A method for sorting small particles using apparatus which includes means for generating a fluid jet having said particles suspended therein, sensor means across the path of said fluid jet for generating a particle detect pulse and a droplet-charge-enable signal in response to a selected characteristic of a particle, means for acoustically pulsing said fluid jet to cause separation thereof into droplets in a discrete separation zone, said pulsing means including a clock generating means for generating a clock pulse for each droplet to be formed, electrical charging means operatively coupled to said fluid jet, electrical delay means having a period of delay equal to the time of passage of a particle passing from the sensor means to said droplet separation zone, whereby each particle-containing droplet, as it forms, is impressed with a charge by said charging means of a magnitude controlled by said droplet-charge-enable signal generated for that droplet, electrical deflection means positioned with respect to said droplet path, said electrical deflection means deflecting a droplet according to its charge, the method comprising the steps of:

(a) generating a timing pulse as a function of said clock pulse, wherein said timing pulse remains on for an abort interval



corresponding to when said sensor means would detect a particle in a position where it will fall between adjacent droplets during droplet formation;

(b) comparing said abort interval pulse with said particle detect pulse and outputting an abort pulse if said detect pulse is detected during said abort interval; and

(c) disabling said charge enable signal in response to the generation of said abort pulse.

4,347,936

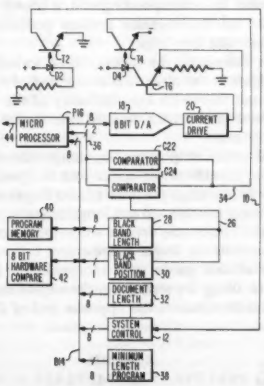
BLACK BAND DETECTOR FOR DOCUMENT SORTING MACHINES

Harold A. Fasig, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 5, 1980, Ser. No. 175,366

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—3.3 **10 Claims**



1. A system for detecting the boundaries between moving batches of documents in which the boundaries are marked by the presence of black band documents positioned between adjacent batches of documents to be sorted, comprising:

a first light source and a first light sensor spaced apart across a document path;

said first light sensor detecting the passage of documents between the light source and the sensor;

a second light source and a second light sensor spaced apart across the document path;

means for adjusting the intensity of the second light source including voltage regulating means to enable the second

light sensing device to provide a preselected output voltage as the leading edge of a document passes between the light source and the light sensing device;

said second light sensor providing varying output signals as documents pass between the second light source and the second sensor along the document path, and

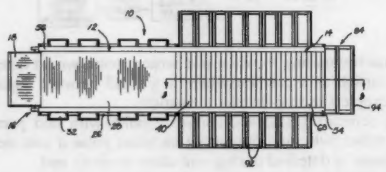
means responsive to said varying output signals to establish when a black band document passes said light sensor, thereby establishing the existence of a boundary between adjacent batches of documents.

4,347,937

MACHINE FOR SORTING OBJECTS BY SIZE

Robert R. Reich, Odessa, Mo., assignor to Triple R Designs, Inc., Odessa, Mo.

Filed Sep. 11, 1980, Ser. No. 186,190
Int. Cl.³ B07C 5/06
U.S. Cl. 209—622 **8 Claims**



1. A machine for sorting objects by size comprising:

an elongated supporting frame;

a continuous carrier chain extending longitudinally on each side of the frame;

means for synchronously driving said chains;

a plurality of spaced, transversely extending generally parallel rods spanning the distance between said chains and carried thereby for longitudinal movement with said chains;

a finger member carried by each of said rods, said fingers each having an upper hook portion for swingable engagement with its corresponding rod, a lower free edge portion and an intermediate arcuate portion between said hook and said free edge;

means for delivering the objects to be sorted onto the rods and fingers at the object-receiving end of the machine for movement therewith longitudinally of the machine when the chains are driven toward the opposite end of the machine; and

a toothed guide strip extending longitudinally adjacent at least one of said carrier chains and in a position to engage the lower free edge portions of said finger members as the finger members are moved longitudinally of the machine when the chains are driven whereby to impart vibrating movement to the finger members,

the teeth of said guide strip increasing in height as they progress along the strip from the object-receiving end of the machine towards the opposite end of the machine.

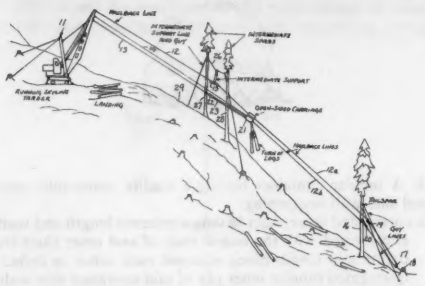
4,347,938

RUNNING SKYLINE INTERMEDIATE SUPPORT AND MULTI-SPAN CARRIAGE

Joseph W. Gorsh, Missoula, Mont., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 11, 1979, Ser. No. 102,484
Int. Cl.³ B66C 21/00
U.S. Cl. 212—121 **8 Claims**

1. A logging system comprising a yarder, tail-spar means, running skyline means interconnecting the yarder and said tailspar means, load carriage means, means movably supporting said carriage means on said skyline means, said skyline means including a haulback line, intermediate support means located between the yarder and said tailspar means, said intermediate support means comprising intermediate spar means, a hanger bar suspended from said intermediate spar means, shoe means adjacent to the lower portion of said hanger bar and supportingly engaging said haulback line on the underside thereof, and transverse shaft means pivotally connecting said shoe means to said hanger bar, said carriage means having a longitudinally extending side opening located to form a passageway for said transverse shaft means when the carriage means moves past said shoe means, said shoe means comprising longitudinal cover means retentively surrounding the haulback



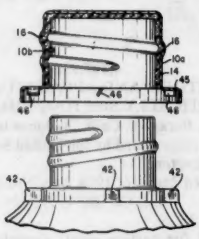
line, said longitudinal cover means comprising a downwardly facing channel-shaped elongated rail member mounted on said shoe means, said carriage means comprising sheave means engageable on said rail member, said sheave means including a walking beam member pivoted to said carriage means, a pair of sheaves mounted on opposite sides of the pivotal connection of said walking beam member to said carriage means, said sheaves being engageable on said rail-member, and movable safety gate means on said carriage means normally overlapping said side opening and being yieldably engageable by said transverse shaft means to allow the carriage to move past said shoe means.

4,347,939

THERMOFORMED CLOSURE OF COMPOSITE MATERIAL

John D. Upton, 76 Clapboard Hill Rd., Green's Farms, Conn. 06436

Filed Sep. 24, 1976, Ser. No. 726,223
Int. Cl.³ B65D 41/34
U.S. Cl. 215—252 **3 Claims**



1. A container closure comprising a thermoformed unitary composite material structure having

an outer shell of thermoformed thermoplastic material of substantially uniform thickness throughout except in the areas where deformed during thermoforming and having a top wall and a skirt wall depending therefrom,

and a liner of compressible cellular foam thermoplastic material located within and being coextensive with the entire inner surface of said outer shell, said liner being of substantially uniform thickness throughout except in the areas where deformed during thermoforming and bonded

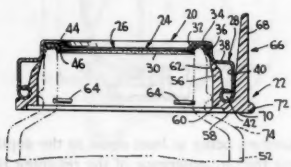
to the inner surface of said shell and formed to the desired shape during the thermoforming of the closure,

and at least one tab cut through the shell and liner of said closure skirt wall and extending inwardly therefrom, said tab adapted for engaging a member on the container as the closure is unfastened therefrom.

4,347,940
LEVER-OFF TAMPER-INDICATING COMPOSITE CLOSURE

Elmer J. Boik, Lombard, and F. Paul Marshall, Park Forest, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 10, 1981, Ser. No. 252,714
Int. Cl.³ B65D *41/32*
U.S. Cl. 215—253 **15 Claims**

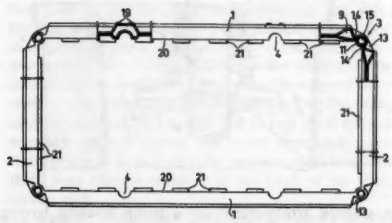


1. A closure comprising a shell including an end panel and a depending uninterrupted conventional skirt, there being an annular corner between said end panel and said skirt, a sealing ring underlying said end panel generally at said corner, and lever means and support means for said lever means formed separately of said shell and carried by said skirt, said lever means being positioned for engaging a container shoulder to lift said shell.

4,347,941
PALLET COLLAR

Sigvard Johansson, Gränna, and Wells R. S. Pearson, Gnosjö, both of Sweden, assignors to Gnosjöplast Aktiebolag, Gnosjö, Sweden

Continuation of Ser. No. 77,100, Sep. 10, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,773
Claims priority, application Sweden, Sep. 8, 1978, 7809452
Int. Cl.³ B65D *19/10*
U.S. Cl. 220—6 **1 Claim**

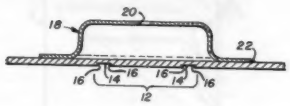


1. A pallet collar comprising two pairs of substantially rigid plastic walls each having opposite ends and hinges at said opposite ends, said walls being interconnected by means of said hinges only at said respective ends, each wall having a bottom edge forming a support surface for engagement with the upper surface of the peripheral edge of a pallet to thereby support the pallet collar upon the pallet, and an external flange projecting downwards from the outer peripheral edge of said bottom edge for engaging the outer circumference of the peripheral edge of the pallet, each one of at least one pair of mutually opposite walls being provided on its inside with an integral internal supporting rib which extends substantially parallel to said bottom edge of the respective wall along at least a major portion of said wall above said support surface for carrying a removable bottom in cooperation with the supporting rib of the opposite wall, each of said internal supporting ribs extending in the same plane as the supporting rib of the other wall in the folded out working position of the pallet collar, each supporting rib being divided into a plurality of individual portions which are separated from each other by interspaces, each supporting rib of a pair of adjacent walls being located just opposite an interspace between two supporting rib portions of the remaining pair of adjacent collar walls when the pallet collar is folded into a collapsed, substantially flat condition.

4,347,942
PRESSURE RELIEF DEVICE AND METHOD OF FABRICATION THEREOF

Robert H. Jernberg, East Hampton, and Edwin A. Barton, Colchester, both of Conn., assignors to Pressure-Pak Container Co., Inc., East Hampton, Conn.

Filed Nov. 24, 1980, Ser. No. 209,880
Int. Cl.³ B65D *8/00, 25/00;* B23K *31/02;* F16K *17/14*
U.S. Cl. 220—89 A **5 Claims**



1. A pressure vessel with an integral pressure relief valve comprising:

a pair of cylindrical vessel halves, said vessel halves having been formed from low carbon steel by a deep drawing operation, said vessel halves being joined together by welding to define the vessel, at least one end of said vessel having an arcuate shape which is other than hemispherical when viewed in cross-section;

a coined pattern in said one end of said vessel, said pattern being in the form of an arcuate groove which defines a region which acts as a rupturable valve member, said groove extending inwardly from the vessel exterior to a depth which is in the range of 67% to 45% of the thickness of said one end, said groove having a bottom which is at least partly flat; and

a generally cup-shaped restrictor means having an inner wall surface defining the interior of said restrictor means, said wall surface having a cross-sectional area that is greater than said coined pattern and is arranged to surround and enclose said coined pattern within the vessel, said restrictor means being secured at a location adjacent the perimeter of the restrictor means, said location being small with respect to said perimeter, a major portion of said perimeter along with the rest of said restrictor means except for at said location remaining unsecured to said vessel to allow for partial relative separate movement of said restrictor means during deformation of said one end due to internal pressure to prevent interference of said restrictor means with said deformation, said restrictor means having aperture venting means in registration with said region of said coined pattern for rupture of said valve member by an excessive internal pressure, said aperture venting means being of a size smaller than said region of said coined pattern to prevent too rapid a discharge from said vessel upon fracture of said valve member.

5. A method of fabricating a pressure vessel comprising:

forming a pair of vessel halves by deep drawing;

coining the end of a first of said halves to form a narrow arcuate groove having a bottom which is at least partly flat, said groove extending inwardly from the exterior of the vessel half, the depth of said groove being in the range of 45% to 67% of the vessel half wall thickness;

spot welding an apertured member to the interior of the said vessel first half, at a location adjacent the outer perimeter of said member spaced radially outwardly from said groove, said member being positioned with the aperture therein spaced from and in registration with the region disposed inwardly of the arcuate groove formed during the coining step; and

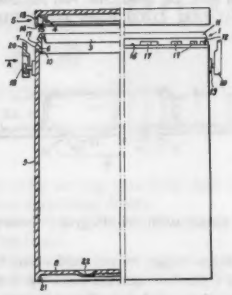
welding the vessel halves together to define a pressure vessel.

4,347,943

CONTAINERS

Roger E. Hackwell, Saffron Walden; Philip D. Gale, Gidea Park, Romford, and Eric K. L. Mason, Colchester, all of England, assignors to National Plastics Limited, London, England

Filed Apr. 14, 1981, Ser. No. 254,057
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **10 Claims**



1. A container and lid combination in which the container has a base, a side wall or walls and an open end opposite to the base defined by a peripheral flange extending inwardly with respect to the side wall or walls and downwardly towards the base, and the lid has a closure part which is a sealing fit within the peripheral flange wherein the container comprises two components each integrally moulded from plastics material and secured together, the said components being a top component including said peripheral flange and having lid-retaining means adjacent to its periphery and independent of the peripheral flange for engaging complementary means on the lid when the closure part of the lid is fitted within the peripheral flange, and a bottom component including the base of the container, at least one of the said components having an integral wall part which comprises the side wall or walls of the container or part of the side wall or walls.

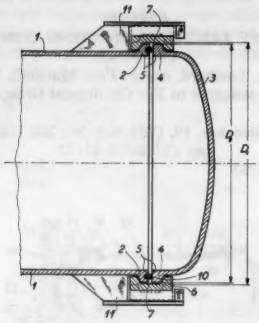
4,347,944

COVER FOR A CYLINDER-SHAPED PRESSURE CONTAINER

Niels Moldrup, Rytterhegnet 9, 3400 Allerod, Denmark

PCT No. PCT/DK79/00005, § 371 Date Oct. 17, 1980, § 102(e) Date Oct. 17, 1980, PCT Pub. No. WO80/01831, PCT Pub. Date Sep. 4, 1980
PCT Filed Feb. 22, 1979, Ser. No. 198,146
Int. Cl.³ B65D *45/32*
U.S. Cl. 220—320 **7 Claims**

1. Cover for a cylinder-shaped pressure container such as a vacuum impregnation container or an autoclave which at the mouth edge has members for holding a tight fitting closure member against the mouth edge, characterized in that the mouth edge of the container (1) and the closure member (3) both have a radially outwards directed annular flange (2,4), the flanges having cooperating contact faces (5) and each a sloping surface, whereby the width of the two flange members (2,4) is decreasing towards the outer edge, the cover further comprising a one-piece, unitary, circular, retaining ring (6) which is placed close to the flange members (2,4) and which is ended up by two free ends (8), and that the retaining ring (6) has a slot (7) which is open towards the centre and corresponding to the cross section of the flange members (2,4), said width of said



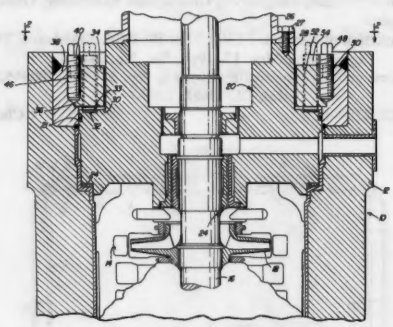
two flange members being at least equal to the depth of said slot, and where the circumference of the retaining ring (6) is smaller than the outer circumference of the flanges (2,4), so that the free ends (8) of the one-piece, unitary, circular, retaining ring (6) can be pulled towards each other to a closed position, when the flange members (2,4) are assumed in the slot (7) of the ring (6).

4,347,945

PUMP CLOSURE FASTENING MEANS

Rudolf Fehlau, Downey, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 5, 1981, Ser. No. 260,611
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—327 **5 Claims**



1. A closure arrangement for a pump housing having a generally cylindrical bore, comprising:

a closure member having a first cylindrical portion closely fitting into said bore and a second cylindrical portion defining a shoulder with said first portion which faces in an outwardly direction with respect to said housing;

a closure ring surrounding said second portion and positioned over said shoulder;

a plurality of spaced threaded openings at the juncture of the periphery of said closure ring and said housing, said openings each having a generally semi-circular portion in said closure ring and a generally semi-circular portion in said housing;

a threaded shear stud in each opening to join said closure ring and said housing; and

compression means connected to said closure ring engaging said shoulder.

4,347,946

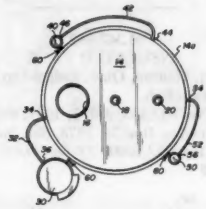
SUCTION SYSTEM WITH COVER-PORT CAP ATTACHMENT BREAKAWAY TAB

Robert L. Nichols, 808 Fort Worth St., Jacksonville, Tex. 75766

Continuation of Ser. No. 955,531, Oct. 30, 1978, abandoned. This application May 18, 1981, Ser. No. 264,611

Int. Cl.³ A61M *1/00*; **B65D** *55/16, 41/18, 47/14*

U.S. Cl. 220—375 **1 Claim**



1. In a suction system for draining fluid from a source, a receptacle cover comprising:

(a) a plurality of ports located in the receptacle cover, including a first port for connection to a vacuum source, a second port for receiving fluid from the source and a third port for emptying collected fluid contained within the receptacle, said third port having a larger dimension than said first and second ports;

(b) A first port closure member dimensioned to engage and close said first port, a second port closure member dimensioned to engage and close said second port and a third port closure member dimensioned to engage and close said third port, said third port closure member being larger than said first and second closure members;

(c) a first flexible connecting line integrally molded and attached at one end to said first port closure member and at a second end to the receptacle cover at a first point of attachment for permanently attaching said first port closure member to the edge of the receptacle cover, said flexible connecting line having sufficient length to allow said first port closure member to engage and close said first port, a second flexible connecting line integrally molded and attached at one end to said second port closure member and at a second end to the receptacle cover at a second point of attachment for permanently attaching said second port closure member to the edge of the receptacle cover, and a third flexible connecting line integrally molded and attached at one end to said third port closure member and at a second end to the receptacle cover at a third point of attachment for permanently attaching said third port closure member to the edge of the receptacle cover; and

(d) a separate breakaway tab means integrally molded and attached to each of said port closure members and to said receptacle cover for temporarily separately attaching each of said port closure members to the edge of the receptacle cover at a different point of attachment for each port closure member, said separate breakaway tab means spaced apart and distinct from said first, second and third points of attachment, each of said breakaway tab means being separable for allowing said port closure members to be disengaged from the receptacle cover at said points of attachment by said tab means to permit said port closure members to be moved to engage and close said ports, and each of said tab means having a portion of reduced thickness disposed adjacent said port closure members to provide a point of severance adjacent said port closure members.

4,347,947

CONTAINER AND COVER WITH TWO GASKET SEAL

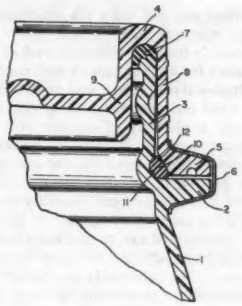
Theo Hammes, Ingenieur, Fed. Rep. of Germany, assignor to Mauser-Kommandit Gesellschaft, Bruhl, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,647

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 7935222[U]

Int. Cl.³ B65D *53/00*

U.S. Cl. 220—378 **5 Claims**



1. A container for storing fluids having a neck with an opening, a cover for attachment to said neck, said cover having an inner rim disposed internally of the neck of the container and an outer rim disposed externally of said neck in circumventing relation therewith, a first gasket disposed between the inner rim and the outer rim of the cover in engagement with the upper edge of said neck to space the cover axially from said upper edge by a predetermined distance, a first flange on the outer rim of the cover extending radially outward thereof, a second flange on the container extending radially outward thereof and axially facing the first flange in spaced relationship therewith said spacing being less than said predetermined distance by which the cover is axially spaced from the upper edge of the container neck and an annular connecting element operative for urging said first and second flanges together into alignment in the axial direction of the container, wherein the improvement comprises a second gasket supported radially and axially said second gasket in contact with said cover and said neck.

4,347,948

CONTAINER FOR FILLING IN LIQUID

Minoru Hamada, Kawanishi; Nobuyuki Nakamura, Takatsuki, and Akira Odajima, Ibaraki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

PCT No. PCT/JP79/00229, § 371 Date Mar. 31, 1980, § 102(e) Date Mar. 31, 1980, PCT Pub. No. WO80/00431, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 29, 1979, Ser. No. 196,052

Claims priority, application Japan, Aug. 31, 1978, 53-107302; Nov. 1, 1978, 53-135487; May 29, 1979, 54-67014

Int. Cl.³ B65D *25/16*

U.S. Cl. 220—404 **5 Claims**

1. A container for holding liquids, said container comprising:

a rigid cylindrical main body, said main body having an open end, a fixed end member sealing one end of said main body, a plurality of annular ring retaining means extending around the inner periphery of said main body, each means being taken from the group consisting of an annular groove in the cylindrical portion of said main body and a projection, said plurality of said means being spaced from

each other axially in the direction of the central longitudinal of said main body, at least one of said means being adjacent the open end of said main body;

a plastic inner bag removably positioned inside said main body and having a protruding open end portion projecting out of said main body open end when said bag is positioned inside said main body and folded downwardly around the outer periphery of said main body;

a plurality of resilient ring members each removably positioned within said main body, one engaged with said inner bag and with said retaining means adjacent the open end of said main body, and at least one further ring member engaged with said inner bag and with a further retaining means spaced inwardly from said open end of said main body;

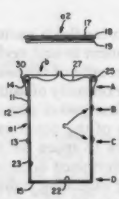
a longitudinal member which is attached to and connects said ring members together; and

a lid removably fitted to said open end of said main body.

4. A container for holding liquids, said container comprising:

a rigid cylindrical main body, said main body having an open end, a fixed end member sealing one end of said main body, and a plurality of annular ring retaining means extending around the inner periphery of said main body, each means being taken from the group consisting of an annular groove in the cylindrical portion of said main body and a projection, said plurality of said means being spaced from each other axially in the direction of the central longitudinal axis of said main body, at least one of said means being adjacent the open end of said main body;

a plastic inner bag removably positioned inside said main body and having a protruding open end portion projecting



out of said main body open end when said bag is positioned inside said main body and has an outer and an inner layer integral with the remainder of said bag, said outer layer being folded downwardly and around a portion of the outer periphery of said main body and said inner layer being drawn together and secured at the center of said open end of said main body for closing the inside of said inner bag;

a plurality of resilient ring members each removably positioned within said main body, one engaged with said inner bag and with said retaining means adjacent the open end of said main body, and at least one further ring member engaged with said inner bag and with a further retaining means spaced inwardly from said open end of said main body; and

a lid removably fitted to said open end of said main body.

5. A container for holding liquids, said container comprising:

a rigid cylindrical main body, said main body having an open end, a fixed end member sealing one end of said main body, and a plurality of annular ring retaining means extending around the inner periphery of said main body spaced axially in the direction of the central longitudinal axis of said main body, at least one of said means being adjacent the open end of said main body;

a plastic inner bag removably positioned inside said main body and having a protruding open end portion projecting out of said main body open end when said bag is positioned inside said main body and folded downwardly around the outer periphery of said main body;

a plurality of resilient ring members each removably positioned within said main body, one engaged with said inner bag and with said retaining means adjacent the open end of said main body, and at least one further ring member engaged with said inner bag and with a further retaining means spaced inwardly from said open end of said main body; and

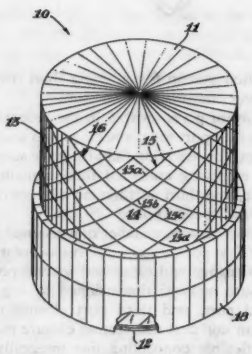
a lid removably fitted to said open end of said main body, the surface of said lid facing the inside chamber of said main body being adapted to receive an annular removable packing around its outer peripheral surface and is lined with a removable plastic sheet, said plastic sheet having perforations around segments of its outer peripheral surface aligned with said packing, the packing being applied to said lid with said plastic sheet between the packing and the lid with adhesive securing the portions of the packing exposed through said perforations to said lid.

4,347,949

INSULATED TANK

Robert B. Bennett, Hebron, Ohio, assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 813,148, Jul. 5, 1977, Pat. No. 4,146,952.
This application Jun. 26, 1978, Ser. No. 918,978
Int. Cl.³ B65D *88/08, 90/06*
U.S. Cl. 220—415 **4 Claims**



1. An improved thermally insulated tank, the tank being of generally cylindrical configuration having a top, a bottom, and a generally cylindrical side wall, a plurality of elongate tension members in generally spaced relationship, extending from a location generally at the top of the tank to a location generally at the bottom of the tank, the tension members being generally disposed against the outer surface of the generally cylindrical tank wall, the tension members being generally helically disposed, a plurality of insulating panels disposed about the tank wall, the panels being affixed at least to the helically disposed tension members.

4,347,950

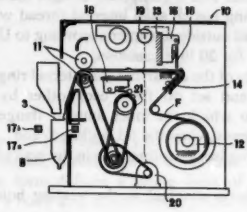
PACKING MACHINE WITH APPARATUS FOR AUTOMATICALLY STOPPING BAG MATERIAL TRANSFER ROLLERS

Masami Onishi, Tokyo, Japan, assignor to Taiyo Shokai Co., Ltd., Japan

Filed Sep. 15, 1980, Ser. No. 187,063
Claims priority, application Japan, Sep. 17, 1979, 54-126903[U]
Int. Cl.³ B65G *59/00*
U.S. Cl. 221—13 **1 Claim**

1. A packing machine comprising a pair of intermittently operated pinching rollers for intermittently transferring an elongated strip-like bag material of a collapsed plastic film tube, said bag material comprising a series of interconnected bags each having a heat-sealed bottom portion and an opposite opening portion, each bag of said tube having a flap-like mar-

gin formed transversely across the bag material between said opening portion and said heat-sealed bottom portion, guide means mounted upstream of said pinching rollers for guiding the bag material through a travel path, said guide means comprising a plate having a V-shaped cross-section having a first leg and a second leg from which said first leg is depended, said second leg having a surface for supporting said bag material so that the respective opening portion of the bag material is directed outwardly of said guide means and said flap-like margin is caused to be raised slightly above the surface when passing over the same, detecting means for detecting said flap-like



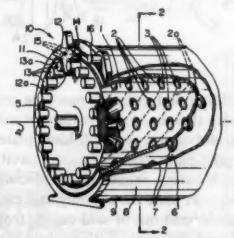
portion, said detecting means comprising a limit switch having an elongated contact mounted adjacent the surface of said guide means, said contact being releasably engageable with said margin responsive to the raising of said margin above the surface, means for stopping movement of said bag material in response to detection by said detecting means of said flap-like portion, and timer means for stopping rotation of said rollers, said timer means being constructed so that it can be activated longer than the time required for each intermittent travel of the bag material for a distance corresponding to the length of a single bag section.

4,347,951

AERIAL DISPENSING APPARATUS

Arthur D. Wood, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Nov. 4, 1980, Ser. No. 203,909
Claims priority, application Canada, Dec. 18, 1979, 343202
Int. Cl.³ G07F *11/00*
U.S. Cl. 221—86 **5 Claims**



1. An aerial dispensing apparatus comprising:

a cylindrical magazine having a plurality of receptacles for receiving articles arranged in helical rows about the periphery thereof, said magazine being rotatable about a central longitudinal axis thereof,

a rotatable selector sleeve disposed concentrically around the magazine, said selector sleeve having a helical row of apertures arranged to align with a row of receptacles of the magazine,

stepping means operatively interconnecting said selector sleeve with the magazine for synchronized rotation throughout a major portion of each revolution thereof and, once every revolution, to step the selector sleeve, relative to the magazine, angularly an amount corresponding to the angular spacing of adjacent helical rows of receptacles of the magazine,

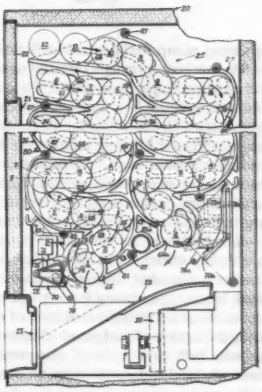
an outer casing disposed around the selector sleeve, said casing having longitudinally extending opening means for allowing sequential release of articles from the receptacles as the apertures of the selector sleeve sequentially align with said opening means.

4,347,952

SERPENTINE MAGAZINE FOR CAN VENDERS

Floyd V. Bookout, Arlington Heights, Ill., assignor to Rock-Ola Manufacturing Corporation, Chicago, Ill.

Filed Oct. 20, 1980, Ser. No. 199,012
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—129 **6 Claims**



1. For use in an automatic coin controlled machine for vending cylindrical articles, a magazine for holding a plurality of generally cylindrical articles, comprising: a pair of laterally spaced wall members having abuttable means projecting integrally from opposing faces thereof and disposed at selected spaced locations thereon, means interconnecting said wall members with opposing said abuttable means engaging one; each of said wall members having a plurality of oppositely directed, vertically and laterally spaced, curvilinear flight sections, each merging at its lower end with a horizontal flight section extending toward an opposing said curvilinear flight section; said flight sections being formed integrally with and projecting outwardly from a said wall member so that corresponding flight sections on opposed faces of said pair of wall members are in abutting alignment to formulate a pair of laterally spaced, vertical serpentine columns therebetween; each column having two laterally spaced serpentine tracks for movement of articles therealong; said pair of serpentine columns being substantially alike and arranged in nonoverlapping, front-to-back spaced relationship within their associated magazine; each said column having an open loading end at the upper end thereof, with the rearmost of the columns having its loading end disposed above the loading end of the foremost of said columns; an open discharge end at the lower end of each said column, with the discharge end of the foremost of said columns releasing articles toward the front of the machine and the discharge end of the rearmost of said columns releasing articles toward the rear of said machine; and a periodically operable vend mechanism mounted opposite the lower discharge end of each of said columns and operable to release articles one-by-one therefrom.

4,347,953

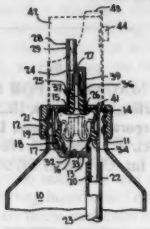
ELASTOMER BULB DISPENSING PUMP

Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20767

Filed May 30, 1980, Ser. No. 154,607

Int. Cl.³ B65D *37/00*; B05B *11/00*

U.S. Cl. 222—207 **9 Claims**



8. A dispensing pump for dispensing fluid contents from a container, said pump comprising a housing member, a stem and a bulbous elastomer diaphragm which fits into said housing member to define a variable volume pump chamber having a quiescent state wherein the chamber is at maximum volume, said diaphragm and said housing member defining inlet valve means for admitting fluid from said container into said pump chamber during expansion of said pump chamber and blocking flow communication between said pump chamber and said container during contraction of said pump chamber and when said pump chamber is in its quiescent state, said stem and diaphragm defining outlet valve means for expelling fluid to ambient from said chamber during contraction of said pump chamber and blocking communication between said pump chamber and ambient in the quiescent state of said pump chamber and during expansion of said pump chamber, and means for maintaining said bulb in a state of compression within said pump chamber in said quiescent state to positively seal said inlet valve means.

4,347,954

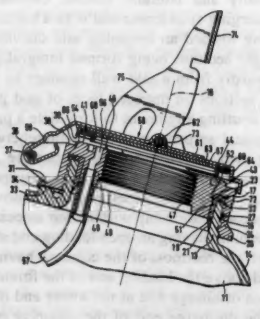
CLOSURE FOR A CANISTER

Wolfram Schiemann, Hohenzellern Platz 1, 7140 Ludwigsburg, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 196,194

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—484 **4 Claims**



1. In a closure for a container made of extruded plastic with a capacity in the 20-30 liter range with an integral plastic nipple having an external thread, comprising:

a metallic collar coaxial with the threaded nipple having two eyelets at its sides,

a lid articulated to the collar,

a double claw tiltably carried by the lid having claws which cooperate with the eyelets,

an outer annular flange and an inner annular flange on the lid bottom,

a ring seal held between the outer and inner flanges,

an annular counter surface at the closure for the ring seal, and

a coaxial internal ring in the threaded nipple having a radial flange which goes over the threaded nipple,

the improvement in which:

the internal ring in the threaded nipple is integral with the metallic collar and is composed of light metal,

the internal ring has an axial internal thread with an inside diameter and outside diameter according to U. S. standard thread size for 20 liter canisters,

the radial faces of the collar and the internal ring are in radial alignment and set off from each other by an annular groove into which the inner annular flanges on the lid bottom extends when the lid is closed, and

the internal ring has a venting hole in the wall of the internal ring, and

a venting tube is attached to the venting hole within the canister.

4,347,955

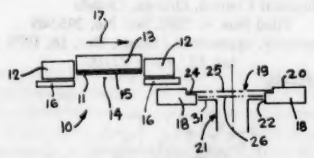
REVERSED MOVING DIE FOLDING AND CREASING MACHINE

Nabil Kamal, 8166 St. Denis St., Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 137,644, Apr. 7, 1980, abandoned. This application Jul. 10, 1980, Ser. No. 167,400

Int. Cl.³ A41H *33/00*

U.S. Cl. 223—38 **14 Claims**



1. An edge folding and creasing machine comprising a die having a die cavity therein, a wall surface in said cavity juxtaposed to an open end of said cavity, folding plates adjacent said open end, a support plate having a punch cavity, a flat punch head in said punch cavity, means for displacing said die with respect to said support plate for aligning said cavities, means to displace said punch head out of said cavity from an open end thereof and into said die cavity with a fabric material disposed on a front face of said punch head and protruding about an outer periphery thereof, actuating means to effect planar displacement of said folding plates inwardly of said die cavity open end to fold said protruding marginal edge material over a peripheral back face of said punch head to form a folded peripheral edge about said fabric, retracting means to retract said punch head from said die cavity free of said material, means to release said material from said die cavity, and a shield plate supported on said front face of said punch head, said shield plate having a smaller identical configured contour as said punch head and disposed concentrically therewith to define a liner locating channel about its outer edge to locate a strip of lining material about a peripheral edge portion of said punch head front face.

4,347,956

HEARING AID SHEATH AND BODY HARNESS

Rosemary K. Berger, Apt. C-2, 29511 E. Jefferson, St. Clair Shores, Mich. 48081

Filed Jan. 19, 1981, Ser. No. 226,465
Int. Cl.[3] A45C *11/00*
U.S. Cl. 224—202 5 Claims

1. A holder for F-M auditory training units for children with severe hearing impairment which comprises:

(a) a case formed from a single sheet of pliable material having a body and lateral wings folded to form the front panel, side panels, and overlapping to form the rear panel of the case,

(b) top and bottom flaps extending from the body to overlap releasably at the body side of the wearer behind the rear panel,

(c) bottom tabs parallel to the bottom flap overlapping in assembly to form the bottom of the case, and

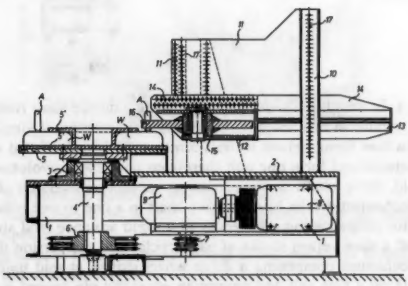
(d) support straps encircling the body and the neck of the wearer secured to the case to confine it to the chest area of a wearer.

4,347,957

APPARATUS FOR DE-BURRING OF WORKPIECES

Peter Rögener, Bad Lauterberg im Harz, Fed. Rep. of Germany, assignor to Universal Maschinen-u Apparatebau GmbH & Co., KG, Herzberg, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,332
Int. Cl.[3] B26F *3/00*
U.S. Cl. 225—93 7 Claims



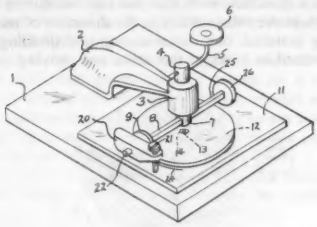
1. Apparatus for de-burring of workpieces, comprising support means for a workpiece to be de-burred; drive means for rotating said support means so that any burr to be removed travels in a predetermined path; and de-burring means stationary relative to the rotating support and extending into said predetermined path so as to be impacted by the traveling burr and cause the same to break off; said de-burring means comprising a disk and means freely turnably mounting said disk.

4,347,958

APPARATUS FOR CUTTING GLASS

Donald C. Wood, Rte. 3, Box 332, Sylva, N.C. 28779

Filed Nov. 10, 1980, Ser. No. 205,686
Int. Cl.[3] C03B *33/04, 33/10*
U.S. Cl. 225—96.5 4 Claims



1. A glass cutter for cutting glass circles comprising a base, a flat circular form having a diameter slightly smaller than that of the circle to be cut, means for supporting said form on said base in a predetermined position, so that the glass to be cut may be placed on top of said form, a bracket extending over said form and the glass to be cut and rigidly secured to said base, a spindle rotatably mounted on said bracket on an axis perpendicular to the surface of said form and in alignment with the center of said form, an arm attached to said spindle and extending outwardly therefrom, a cutting tool attached to said arm at a point spaced from the axis of said spindle equal to the radius of the circle to be cut and extending downwardly towards the surface of the glass to be cut and perpendicular thereto, means for rotating said spindle with said cutting tool applied against the glass to be cut with sufficient force to score the glass, means attached to said cutting tool for applying pressure to the glass being scored at a point trailing said cutting tool and spaced slightly from said form, said last mentioned means comprising a shaft extending outwardly from said cutting tool, a member rotatably mounted on said shaft and extending perpendicularly to said shaft a short horizontal distance therefrom, and adjustable means on the trailing end of said member as said cutting tool moves for creating a pressure on the glass being scored as the other end of said member is pressed against the glass with an equalizing pressure, whereby the glass is flexed as the score is made and the score is caused to run through the glass.

4,347,959

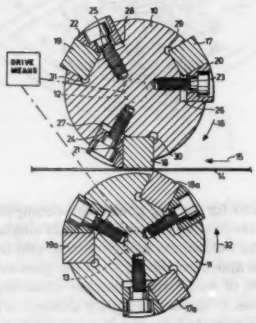
APPARATUS FOR DIVIDING STRIP MATERIAL

Kjell E. G. Ivinger, Finspang, Sweden, assignor to Gränges Aluminium AB, Stockholm, Sweden

PCT No. PCT/SE79/00252, § 371 Date Aug. 19, 1980, § 102(e) Date Aug. 15, 1980, PCT Pub. No. WO80/01259, PCT Pub. Date Jun. 26, 1980
PCT Filed Dec. 17, 1979, Ser. No. 200,499
Claims priority, application Sweden, Dec. 19, 1978, 7813021
Int. Cl.[3] B26F *3/02;* B26D *1/62*
U.S. Cl. 225—97 11 Claims

1. An apparatus for dividing strip material, comprising at least one pair of mutually co-operating cutters, between which the strip material is fed and which are arranged to penetrate said material from mutually opposite sides, characterized in that the two cutters in each pair are mutually substantially parallel at the moment of their penetration into the strip material, and that the one cutter in each pair is arranged to engage the strip material slightly in front of the second cutter as seen in the direction of movement of the strip material, and then to move away from the second cutter in the direction of movement of said strip material, such that the part of strip material located in front of the cutters is separated from the remainder of said strip by a combined cutting and tearing operation;

wherein the cutter arranged to move away from the other cutter is mounted on a body which is arranged for rotation about an axis which is substantially perpendicular to the direction of movement of said strip material and which is spaced from said material; wherein the cutters of each pair are each mounted on a respective roller and said rollers are arranged to rotate in a direction such that the cutters, during a dividing operation, move substantially in the direction of movement of said strip material, one cutter during said dividing operation being located in front of the other and moving at a greater



peripheral velocity than said other cutter; wherein the cutters comprise steel rods of square cross section, and said rods are removably mounted in the rollers in a manner such that the cutter moving at the higher peripheral velocity has its rear, outer edge, as seen in the direction of rotation of the associated roller, and the cutter moving at the lower peripheral velocity has its leading, outer edge, as seen in the direction of rotation of the associated roller, projecting out beyond the cylindrical surface of the associated roller, said outwardly projecting edges of the cutters being used to divide said strip.

4,347,960

APPARATUS FOR LOADING RUNS OF FABRICS

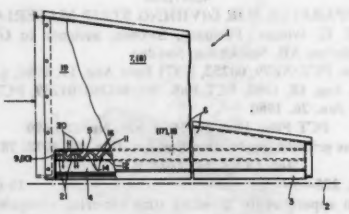
Fritz Gageur, Lindau-Bodolz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 19, 1980, Ser. No. 218,365

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007752

Int. Cl.³ B65H *25/06, 17/32*

U.S. Cl. 226—97 **2 Claims**



1. In equipment for loading runs of fabrics with a gaseous treatment medium and being composed of nozzle boxes sequentially arrayed in the direction of advance of the run of material and extending transversely thereto, said boxes being laterally supplied with the treatment medium which is blown out from orifices located therein against the run of material, a covering means being mounted in each nozzle box above a slotted discharge nozzle and being of such a design that the covering means has a wavy profiled surface extending longitudinally parallel to the direction of jet and parallel to the longitudinal direction of the discharge nozzle, said wavy profiled surface forming a number of stop apertures above the discharge nozzle and perpendicularly thereto,

the improvement comprising upper and lower partition means covering ends of said covering means which point toward side walls of said nozzle box, whereby said nozzle box is divided into an upper and a lower barrier space with the latter including at least one discharge nozzle,

said upper partition means covering ends of the wavy profiled surface of said covering means open toward said upper barrier space, and said lower partition means covering an area extending beyond the ends and toward the center of the nozzle box of the wavy profiled surface of said covering means which is open toward the lower barrier space and the discharge nozzle,

said partition means between walls of the nozzle box and the ends of said covering means forming lateral channels which connect the wavy profiled surfaces of said covering means which are open toward said upper and lower barrier spaces.

4,347,961

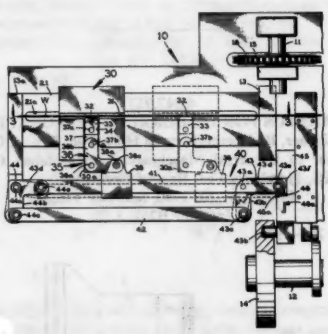
RAPID ADVANCE LONG DWELL FEED MECHANISM FOR MULTIPLE SLIDE MACHINES

Frank G. Smith, 911 Alabama Ave., Ft. Lauderdale, Fla. 33312

Filed Feb. 23, 1981, Ser. No. 236,702

Int. Cl.³ B65H *17/36*

U.S. Cl. 226—158 **12 Claims**



1. In a multiple slide machine having a device shaft rotating at a uniform rate and a reciprocating strip material feeder, said machine being driven to feed a measured length of said strip material and form one unit therefrom with each revolution of said drive shaft, a reciprocating motion conversion drive mechanism driven by said drive shaft in a one to one rotation ratio reciprocating said feeder in a rapid advance feed stroke and a slow return stroke of each cycle, said conversion drive mechanism comprising a drive wheel driven at said uniform rate on a first axis and having an eccentric pin spaced a first predetermined distance from said first axis, a driven wheel means rotating on a second axis spaced a second predetermined distance from said first axis, said driven wheel means having a radially extending slot engaged by said pin whereby said driven wheel means is rotated at a variable rate by said drive wheel, and a reciprocating pitman arm driven by said driven wheel means and linked to said feeder for effecting said rapid advance feed stroke and slow return stroke, said machine operation being timed for a dwell period during said advance stroke and for an operating period during said return stroke.

4,347,962

BRAKE ROLL FOR SPANNING SEVERAL BANDS

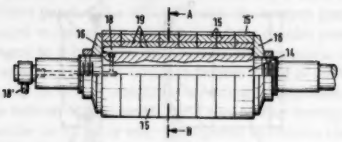
Ewald Uphues, Hemer, Fed. Rep. of Germany, assignor to Sundwiger Eisenhütte Maschinenfabrik Grah & Co., Hemer-Sundwig, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,673

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933775

Int. Cl.³ B65H *23/08*

U.S. Cl. 226—195 **7 Claims**



1. A brake roll for spanning several, adjacently guided bands comprising:

a. a shaft;

b. a plurality of runner rings slidingly disposed on said shaft;

c. radially movable brake members disposed between said shaft and said rings, in sliding contact with said rings, for braking said rings with respect to said shaft;

d. means to apply a radial pressure load to said brake member; and

e. the one of said runner rings and brake members which is more heavily abrading divided up into running zones and braking zones, pressure being applied to said means to apply only in said braking zones.

4,347,963

HYDRAULIC NAILING MACHINE

Lars J. T. Billing, Värmlandsgaten 2, S-25252 Helsingborg, Sweden

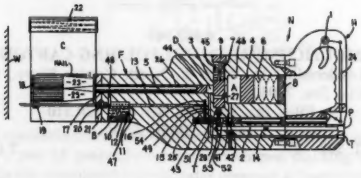
PCT No. PCT/SE79/00010, § 371 Date Sep. 19, 1979, § 102(e) Date Sep. 6, 1979, PCT Pub. No. WO79/00531, PCT Pub. Date Aug. 9, 1979

PCT Filed Jan. 16, 1979, Ser. No. 154,413

Claims priority, application Sweden, Jan. 19, 1978, 7800644

Int. Cl.³ B25C *1/04*

U.S. Cl. 227—8 **8 Claims**



1. A hydraulic nailing pistol, comprising:

a frame means including an inlet opening and an outlet opening;

a magazine means secured to said frame means for housing plural nails;

guide cylinder means on said frame means;

a nail driving piston rod means reciprocally mounted in said guide cylinder means for effecting a driving of a nail from said magazine means;

hydraulically operated means for effecting a reciprocation of said nail driving piston rod means, said hydraulically operated means including:

(a) a first energy accumulator means adapted to be connected in fluid circuit with a pressurized fluid source through said inlet opening, said first energy accumulator means accummulating energy in response to a fluid connection to said inlet opening;

(b) passageway means connecting said first energy accumulator means in fluid circuit with said guide cylinder means on a side of said piston rod means remote from said magazine means;

(c) first valve means intermediate said first energy accumulator means and said guide cylinder means for opening and closing said passageway means;

(d) second energy accumulator means connected in fluid circuit with said guide cylinder means on a mutually adjacent side of said piston rod means as said magazine means, said second energy accumulator means accumulating energy in response to a movement of said piston rod means toward said magazine means;

(e) second valve means intermediate said first energy accumulator means and said inlet opening for opening and closing said fluid connection therebetween;

(f) first means defining a fluid connection between said guide cylinder means at an end thereof between said first valve means and said piston rod means and said outlet opening in said frame means;

(g) third valve means intermediate said guide cylinder means at the end thereof between said first valve means and said piston rod means, and said outlet opening for opening and closing said fluid connection therebetween, said third valve means also including means for effecting a closing of said first valve means in response to an opening of said third valve means;

(h) operating slide means operable between conditions effecting an opening and closing of said second and third valve means and a closing and opening, respectively, of said first valve means;

(i) second means for normally maintaining said operating slide means in a first condition to effect a closing of said first valve means and an opening of said second and third valve means so that said first energy accumulator means will accumulate energy; and

(j) manually operative means for selectively changing the condition of said operating slide means to a second condition to effect a closing of said second and third valve means and an opening of said first valve means so that said piston rod means will be driven by the energy from said first energy accumulator means along the length of said guide cylinder means thereby effecting a driving of a nail from said magazine means and an accumulation of energy in said second energy accumulator means, the energy of said second energy accumulator means being used to effect a return of said piston rod means to a starting position thereof in response to said second means changing said condition of said operating slide means to said first condition thereof.

4,347,964

WIRE BONDING APPARATUS

Nobuhiro Takasugi, Hinodemachi, and Ryuichi Kyomasu, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1980, Ser. No. 149,633

Claims priority, application Japan, May 23, 1979, 54-62608

Int. Cl.³ B23K *28/00*

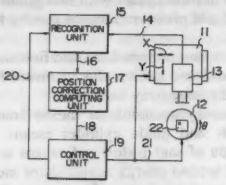
U.S. Cl. 228—4.5 **7 Claims**

1. A wire bonding apparatus for wire bonding a first group of bonding positions disposed on a first member with a second group of associated bonding positions disposed on a second member, one of said first and second members having at least one recognition mark, the apparatus comprising:

a recognition means having a field of view for detecting a presence of the recognition mark in the field of view and for identifying a position of the detected recognition mark in the field of view;

means for successively moving the field of view of said recognition means in a predetermined manner when the

recognition mark is not detected until such time the recognition mark falls within the field of view; and



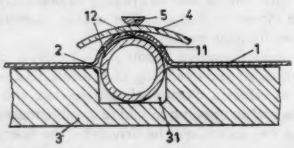
means for computing the positions of said bonding positions based on a detected position of the recognition mark.

4,347,965

METHOD OF CONNECTING THIN METAL SHEETS TO METAL TUBES

Gershon Grossman, Hahorsha 18; Gideon Sivan, Tchernihovski 28a; Tudor Chefner, David Pinsky 37, and Eliyahu Matania, Shoshanat Hacaremel 66a, all of Haifa, Israel

Filed Mar. 20, 1980, Ser. No. 132,300
Claims priority, application Israel, Mar. 28, 1979, 56961
Int. Cl.³ B23K *20/08*
U.S. Cl. 228—107 **6 Claims**



1. A method of connecting a metal sheet to a metal tube, both being preferably components of a solar collector plate, by forming a stripshaped bond between a portion of said sheet and a portion of the circumference of said tube, the method comprising the following steps in combination,

providing said metal sheet with a channeled section, substantially corresponding in size and shape to the contour of said tube, said channel being adapted to contain said tube and being preferably of a depth not more than one half of the tube diameter, while the portions of said sheet adjoining said channeled section are substantially flat and planar,

positioning said tube onto a rigid support which comprises upstanding portions adjacent both sides of said tube extending in the shape of a planar surface to a level above the bottom surface of said tube substantially equal to the distance said tube is predetermined to project beyond said flat and planar portions of said sheet,

filling said tube with water or another non-compressible and non-inflammable liquid and closing the previously open ends of said tube,

positioning said sheet onto said tube and said rigid support, whereby said channel section covers said tube and whereby said planar portions rest on said upstanding portions of said rigid support,

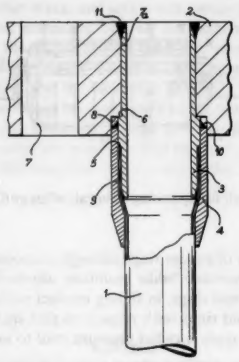
placing an explosive charge in the shape of a bond or ribbon onto the apex of the outside of said channeled section and detonating the charge.

4,347,966

METHOD FOR FIXING A GUIDE TUBE OF A NUCLEAR REACTOR FUEL ASSEMBLY

Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 9, 1980, Ser. No. 157,827
Claims priority, application France, Jun. 14, 1979, 79 15272
Int. Cl.³ B23K *33/00*; F16L *41/08*
U.S. Cl. 228—173 F **1 Claim**



1. A method for fixing a zircalloy guide tube of a nuclear reactor fuel assembly to the steel end plate of said assembly, wherein the following steps are successively performed:

expanding one end of the guide tube;

engaging the expanded end of the guide tube around a sleeve provided with first and second outer shoulders until it abuts against the first outer shoulder of said sleeve;

covering said end with a force-fitted ferrule and squeezing the tube against the sleeve, then welding the upper end of the ferrule to the sleeve above the said first outer shoulder;

introducing the sleeve-tube-ferrule assembly into an opening adapted to receive the same in the end plate, said opening also having a shoulder, until said second outer shoulder of the sleeve abuts against the said shoulder of the end plate opening:

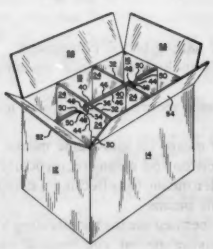
and welding the upper part of the sleeve to the upper part of the opening of the end plate of the assembly.

4,347,967

MULTICOMPARTMENT FOLDING CARTON

Jake Loudermilk, Jr., 1200 W. North Carrier Pkwy., Grand Prairie, Tex. 75050

Filed Jan. 26, 1981, Ser. No. 228,310
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—27 **7 Claims**



1. A multicompartment folding carton comprising:

(a) four articulated side walls;

(b) a pair of foldable, opposed first flaps, each having a

bottom panel and a divider panel, the bottom panel being hinged to one of the side walls and the divider panel being hinged to the bottom panel on its edge opposite the edge attached to the side wall, and each first flap having a central slit therein extending substantially from its side wall hinge, substantially perpendiculary thereto, to a point spaced apart from the outer edge of the divider panel forming panel segments on both sides of the slit and having a bridge between the segments; and

(c) a pair of foldable, opposed second flaps, each having a bottom panel and a divider panel, the bottom panel being hinged to one of the side walls and the divider panel being hinged to the bottom panel on its edge opposite the edge attached to the side wall, the bottom panel of each second flap in its folded condition covering substantially half of the bottom of the carton, each second flap having a notch therein on its outer edge configured to receive the bridge of the divider panel of one of the first flaps in its folded condition.

4,347,968

STACKABLE CARTON FOR PERISHABLE COMMODITIES

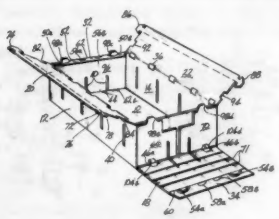
William F. Cornell, Fresno; John P. Vear, Salinas, both of Calif., and E. Anthony Pascuzzi, Arden Hills, Minn., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 89,885, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 936,612, Aug. 24, 1978, Pat. No. 4,175,692. This application Feb. 26, 1981, Ser. No. 238,659

The portion of the term of this patent subsequent to Nov. 27, 1996, has been disclaimed.

Int. Cl.³ B65D *13/00, 5/32*

U.S. Cl. 229—33 **12 Claims**



1. A stackable storage and shipping tray including in combination a pair of generally rectangular shaped stacking panels wherein the completed tray includes opposed at least triple-ply adhesively connected end wall assemblies, said tray further including a generally rectangular floor panel, first and second generally rectangular side wall panels extending from fold lines defining opposite edges of said floor panel, respectively, first and second pairs of side wall flaps, each flap in each of said pairs extending from a fold line defining an end of one of said side wall panels, each of said side wall flaps including at least one tab extending upwardly from an upper edge thereof and at least one recess at its lower edge with at least a portion in vertical alignment with said tab, first and second generally rectangular end wall panels extending from opposite end edges of said floor panel, each of said end wall panels having first and second recesses at its lower edge, said floor panel end edges having openings therein, said end wall panel recesses, said floor panel end edge openings and said tabs being in vertical alignment.

4,347,969

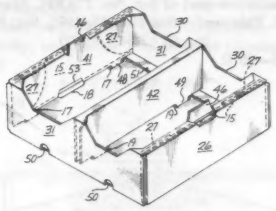
TRAY

William E. Kost, and Norman Schoenberger, Jr., both of Norman, Fla., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed May 8, 1981, Ser. No. 261,831

Int. Cl.³ B65D *5/06*

U.S. Cl. 229—34 HW **14 Claims**



1. A tray comprising

a base panel,

side walls extending upwardly from said base panel,

an upper panel extending between said side walls and being parallel to said base panel,

interior end walls hingedly connected to the ends of one of said panels,

an exterior end wall connected to the ends of the other of said panels,

the inner face of said exterior end wall being contiguous with the exterior face of said interior end wall,

locking flaps hingedly connected only to the side edges of said exterior end walls, said locking flaps being bent around said interior end walls and being contiguous with the interior face of said interior end walls,

a locking partition hingedly connected to the upper panel at each end of said tray, said locking partitions being adjacent said end walls,

locking tabs on the lower edges of said locking partitions,

locking apertures in said base panel aligned with said locking tabs, said locking tabs fitting into said locking apertures and said locking partition holding said locking flaps against the interior face of said interior end wall.

4,347,970

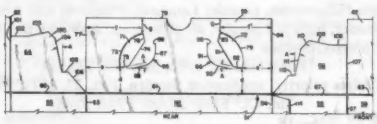
CONTAINER CLOSURE

Robert M. Nardone, Whippany, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 21, 1980, Ser. No. 180,108

Int. Cl.³ B65D *5/10*

U.S. Cl. 229—39 R **8 Claims**



1. In a carton structure having a plurality of side panels each connected by a fold line to one of a series of end closure flaps, there being a major flap having two oppositely located and oppositely angularly related slots each having side edges and upper and lower end edges, said slots being canted with respect to the fold line of said major flap so that none of the slot edges are parallel to the fold line, each inner slot end edge being straight and inclined at a small acute angle relative to said fold line, and two minor flaps, each having a correspondingly canted tab adapted, when the minor flaps are folded inwardly, to slidably enter the slots in the major flap folded thereover

and smoothly overlie the upper surface of the major flap in the slot area.

4,347,971

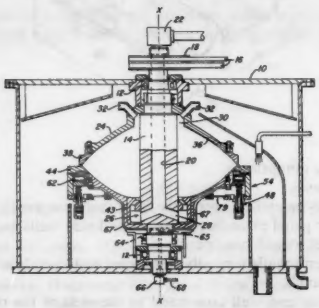
CENTRIFUGE APPARATUS

John Novoselac, Ontario, Canada, assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 959,817, Nov. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 773,991, Mar. 3, 1977, abandoned. This application Feb. 26, 1981, Ser. No. 238,498

Int. Cl.³ B04B *11/00*

U.S. Cl. 233—20 R **10 Claims**



3. A centrifuge comprising: an elongated upstanding shaft rotatable about the longitudinal central axis thereof and a bowl having upper and lower formed portions secured to axially spaced portions of said shaft, respectively, for conjoint rotation therewith; said bowl forming an interior chamber for centrifugally separating an incoming slurry into a product constituent in a radially, with respect to said axis, outer portion of said bowl and an effluent constituent at a portion of said bowl radially inward of said product constituent; said bowl being associated with means for discharging such constituents therefrom; said shaft having passageway means therein for receiving a slurry and for discharging said slurry to a hollow annulus comprising an axially lower portion of an upwardly extending passageway, formed in a lower section of said lower formed portion, which passageway has an uppermost end in open communication with said interior chamber, a part of said passageway above said lower portion of said passageway being provided with means to impart a rotational velocity to a slurry flowing through said passageway upon rotation of said shaft and bowl.

4,347,972

APPARATUS FOR PRODUCTION OF HOT WATER

Björn Fällerström, Onsale; Lennarth Fransson, and Arne Thuvander, both of Ljungby, all of Sweden, assignors to AB CTC, Ljungby, Sweden

Filed Feb. 12, 1980, Ser. No. 120,911

Claims priority, application Sweden, Feb. 27, 1979, 7901726

Int. Cl.³ F28F *27/00*; F24D *3/08*

U.S. Cl. 236—18 **7 Claims**

1. An apparatus for producing hot water, comprising:

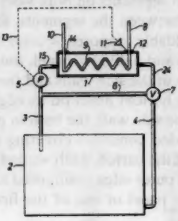
a heat exchanger,

a source of hot water connected to the primary circuit of said heat exchanger for flowing hot water therethrough, and a return line for returning fluid from the primary circuit back to the source of hot water,

pipe means defining a secondary fluid circuit through the heat exchanger such that the fluid in the secondary circuit is in heat exchange relationship with the fluid of the primary circuit, said secondary fluid circuit including means for receiving unheated water and delivering the same as heated water,

a pump in the line between the source and the primary circuit of the heat exchanger,

a shunt passage in parallel with the line which includes the pump and the primary circuit of the heat exchanger, such that fluid downstream from the primary circuit of the heat exchanger can be delivered directly to the pump, bypassing the said source,



and a temperature sensitive device for sensing a drop in temperature of the water in the secondary circuit adjacent to and in heat exchange relationship to the primary circuit, upon commencement of flow through the secondary circuit, to control operation of said pump for causing a flow of water from the said source to the said primary circuit of the heat exchanger and for terminating such flow through the primary circuit upon termination of flow through the secondary circuit.

4,347,973

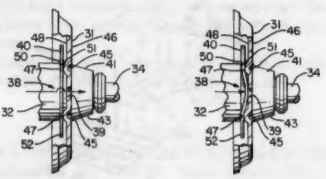
INTERNAL COMBUSTION ENGINE COOLANT SYSTEM, THERMOSTAT THEREFOR AND METHODS OF MAKING THE SAME

Byron L. Jackson, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 21, 1981, Ser. No. 226,800

Int. Cl.³ F01P *7/02*

U.S. Cl. 236—34.5 **40 Claims**



1. In an internal combustion engine coolant system having a radiator for receiving coolant into an inlet thereof from an outlet of said engine through a thermostat disposed intermediate said outlet of said engine and said inlet of said radiator and having a coolant pump for circulating said coolant through said engine from an inlet of said engine to said outlet thereof, said pump having a first inlet interconnected to said outlet of said engine upstream of said thermostat and a second inlet interconnected to the outlet of said radiator while having its outlet interconnected to said inlet of said engine, said thermostat having a vent valve means carried by the main valve member thereof for venting air from said outlet of said engine to said inlet of said radiator when said main valve member of said thermostat is in a closed condition against the main valve seat thereof and said system is being filled with coolant that is being introduced into said radiator and for preventing coolant flow through said vent valve means when said pump is circulating said coolant and said main valve member of said thermostat is in a closed condition against said main valve seat, the improvement wherein said vent valve means comprises a vent opening through said main valve member and a flexible vent

valve member for opening and closing said vent opening, said flexible vent valve member normally being held in spaced relation from said vent opening and being adapted to be flexed against said vent opening to close said vent opening by said coolant being circulated by said pump.

4. In an internal combustion engine coolant system having a radiator for receiving coolant into an inlet thereof from an outlet of said engine through a thermostat disposed intermediate said outlet of said engine and said inlet of said radiator and having a coolant pump for circulating said coolant through said engine from an inlet of said engine to said outlet thereof, said pump having a first inlet interconnected to said outlet of said engine upstream of said thermostat and a second inlet interconnected to the outlet of said radiator while having its outlet interconnected to said inlet of said engine, said thermostat having a vent valve means carried by the main valve member thereof for venting air from said outlet of said engine to said inlet of said radiator when said main valve member of said thermostat is in a closed condition against the main valve seal thereof and said system is being filled with coolant that is being introduced into said radiator and for preventing coolant flow through said vent valve means when said pump is circulating said coolant and said main valve member of said thermostat is in a closed condition against said main valve seat, the improvement wherein said vent valve means comprises a vent opening through said main valve member and a flexible vent valve member for opening and closing said vent opening, said main valve member having a substantially flat surface surrounding said vent opening, said flat surface having abutment means extending outwardly from said flat surface adjacent said vent opening, said flexible vent valve member being adapted to engage said abutment means in one flexed condition thereof to seal around said vent opening at said surface to close said vent opening and to engage said abutment means in another flexed condition thereof that will not seal around said vent opening at said surface so that said vent opening is open.

4,347,974

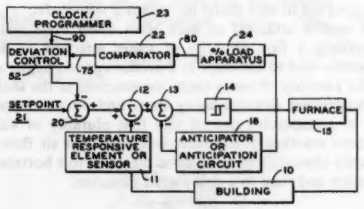
TEMPERATURE CONTROL SYSTEM WITH NIGHT SETBACK PROGRAMMING AS A FUNCTION OF TEMPERATURE CONDITIONING LOAD

B. Hubert Pinckaers, Edina, and Robert T. Ruminsky, Bloomington, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Mar. 5, 1981, Ser. No. 240,741

Int. Cl.[3] F23N *5/20;* G05D *23/00*

U.S. Cl. 236—46 R 6 Claims



1. An improvement in a temperature control system for a building in which a temperature responsive control means and time program means is adapted to control temperature conditioning apparatus to maintain a first temperature during a first predetermined time period and a second temperature during a second predetermined time period and after said second time period, said temperature control returns the temperature to said first temperature after a pickup time period, the improvement comprising,

building temperature conditioning load responsive means having an output indicative of the building load, and

means connecting said output to the temperature responsive means to adjust said temperature responsive control means to maintain said second temperature as a function of building load to maintain a predetermined pickup time period.

4,347,975

BIMETALLIC-CONTROLLED STEAM TRAP

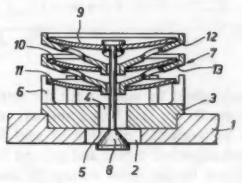
Werner Föller, Stuhr, Fed. Rep. of Germany, assignor to GESTRA-KSB Vertriebsgesellschaft mbH & Co. KG, Bremen, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 210,080

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948686

Int. Cl.[3] F16T *1/04*

U.S. Cl. 236—59 6 Claims



1. In a steam trap of the type having a bimetallic control element disposable at the prepressure side, a valve seat, and a locking element which cooperates with the valve seat and which is actuated by the bimetallic control element and is biased in an operating direction with respect to the valve seat by the prepressure, the improvement comprising:

said bimetallic control element including at least two bimetallic spring disks which are serially connected so that when the locking element is open during the slow-speed stroke of the bimetallic spring disks, the stroke movement of said locking element is equal to the sum of the slow-speed strokes of all of said bimetallic spring disks, and said bimetallic spring disks being different from one another with respect to their spring force and temperature, as well as with respect to each other's spring constant, so that each of the bimetallic spring disks closes the locking element by a spring stroke within a separate section of the total operating pressure range of the steam trap, at temperatures in the proximity of a predetermined pressure-temperature curve.

4,347,976

REGULATING CIRCUIT FOR THE VALVE OF A REFRIGERATION PLANT

Jakob S. Jakobsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 956,649, Nov. 1, 1978, abandoned. This application Apr. 17, 1980, Ser. No. 148,152

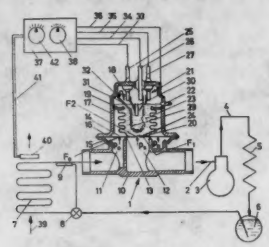
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749240

Int. Cl.[3] G05D *15/00;* F16K *31/00*

U.S. Cl. 236—68 B 2 Claims

1. A valve assembly for a refrigeration plant, comprising, a valve, a reference pressure generator for controlling said valve filled with a liquid vapor medium, a heating resistor in said medium, a first feedback external temperature sensor, a second feedback temperature sensor in said medium, a first bridge circuit including said first temperature sensor and a first operational amplifier, a second bridge circuit including said second temperature sensor and a second operational amplifier, a summating circuit for said bridge circuits including a third amplifier connected to said heating resistor, adjustable resistors at the outputs of said bridge circuits connected to the noninverting input of said third amplifier for varying the relative influ-

ence of either of said first and second sensors on said third amplifier and thereby on the regulation of said valve, capacitor means and feed back resistor means in series between the output and the inverting input of said amplifier, voltage divider means between said output and said capacitor forming a voltage divider energized by said output for setting a time delay integration constant for said first amplifier, and variable resistance means between the junction of said feedback resistor means and said capacitor means and ground forming a voltage divider energized by the input voltage to the inverting input for setting the proportionality factor for said first amplifier.

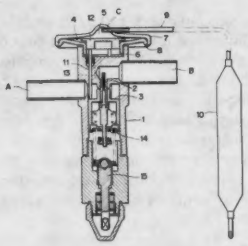


4,347,977

TEMPERATURE RESPONSIVE EXPANSION VALVE

Morio Kaneko, Hidaka, Japan, assignor to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,230
Int. Cl.³ F25B *41/04*
U.S. Cl. 236—92 B **7 Claims**



1. A temperature responsive expansion valve comprising

a valve body having a channel therein and inlet and outlet conduits communicatable with each other through said channel;

a first valve member slidable within said valve body on an inlet side of the channel, said first valve member being normally biased to seat on the channel, having a central bore therein, and defining a chamber in communication with said central bore;

means for counteracting said biased first valve member in response to a temperature in the outlet conduits,

a second valve member slidably provided through said central bore and including a larger diameter section normally biased to seat on the channel and a smaller diameter section, substantially extending through the channel, said second valve member having a passageway to provide communication between the outlet conduit and the chamber;

a bellows provided in said chamber and having a free end coupled with the second valve member; and

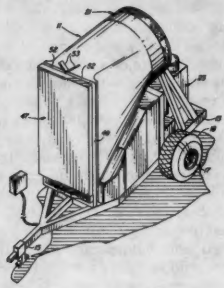
means for providing communication between said inlet conduit and an open end of said bellows.

4,347,978

AGRICULTURAL SPRAYER

Theodore Lenhardt, Winter Garden, Fla., assignor to Raym Company, Inc., Mascotte, Fla.

Filed Aug. 4, 1980, Ser. No. 174,850
Int. Cl.³ A01N *17/08*
U.S. Cl. 239—78 **8 Claims**



1. An agricultural sprayer comprising:

a chassis;

a source of liquid material to be sprayed carried on said chassis;

an axial flow fan disposed on said chassis to generate a substantially axial flow of air;

a flow divider disposed adjacent said fan;

an intermediate covering section surrounding said flow divider, and adjacent to said fan, said covering section having a substantially rectangular cross section at its distal end and a substantially circular cross section at the end proximate to said fan;

an end wall section disposed a predetermined distance from the distal end of the intermediate covering, said end wall section, flow divider and intermediate covering defining a plenum chamber with a pair of vertically disposed emitter orifices;

a plurality of nozzles disposed at predetermined intervals on said end wall section, said nozzles coupled to the source of liquid material to be sprayed;

a pair of shafts each disposed inside said plenum chamber and adjacent to a corresponding one of the emitter orifices defined by the intermediate covering section and the end wall section;

means coupled to said shafts for rotating said shafts;

a vane system attached to each shaft, each vane system comprising a first plurality of vanes attached at their respective end to the shaft at a predetermined angle; and

a second plurality of vanes each one attached to the shaft a predetermined distance away from and on an opposite side of a respective one of said first plurality of vanes whereby rotation of the shaft will cause the air flow to abruptly change from an upward direction to a horizontal direction and then to a downward direction.

4,347,979

SWIMMING POOL CLEANER

Lester R. Mathews, 9810 N. 37th St., Phoenix, Ariz. 85028

Continuation-in-part of Ser. No. 843,870, Oct. 20, 1977, Pat. No. 4,202,499. This application Feb. 4, 1980, Ser. No. 118,317
Int. Cl.³ B05B *3/06*
U.S. Cl. 239—206 **5 Claims**

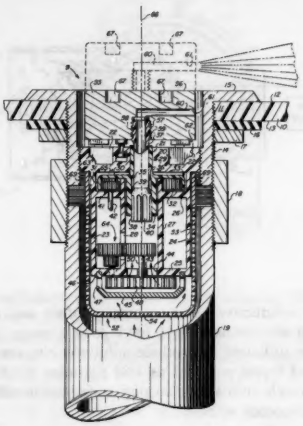
3. A pop-up cleaner for a swimming pool defined by walls, each of said walls having a surface, said pool adapted to have water in the pool, said water having a top surface, said cleaner comprising:

a housing having means for mounting said housing in a fitting;

a substantially cylindrical jet block having a top surface and an

axis of symmetry, means for mounting said jet block on said housing for rotation about the jet block's axis of symmetry, for limited linear movement substantially parallel to the axis of symmetry, and for directing a stream of water over the surfaces of adjacent portions of the walls defining a swimming pool; and

recesses formed in the top surface of the jet block adapted to cooperate with a tool for holding the jet block and for applying torque to the jet block, said jet block and housing being provided with cooperating projections and recesses said projections adapted to be inserted into the recesses whereby torque applied to the jet block can be applied to the housing for removably mounting the housing in the fitting, said fitting being located in a wall of said pool below the surface of the water in the pool from a position above the top surface of the water in said pool, said fitting adapted to be connected to a source of water under pressure.



4,347,980

ORNAMENTAL SPRAYING APPARATUS AND A SPRAYER THEREFOR

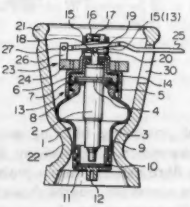
Michinori Seki, Ibaragi, Japan, assignor to Tokushu Aerosol Co. Ltd., Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,558

Claims priority, application Japan, Mar. 25, 1980, 55/038254[U]

Int. Cl.³ B05B *15/00*

U.S. Cl. 239—289 **19 Claims**



1. A manually operable spray dispenser comprising a reservoir chamber, a spray dispensing nozzle extending upwardly out of the reservoir chamber, ornament article holding means mounted at the upper end of said chamber, means for ejecting spray through said nozzle from the chamber, a projecting lever pivotally secured to the ornament article holding means for triggering said spray ejecting means and a sealable opening in the reservoir chamber for recharging said chamber.

4,347,981

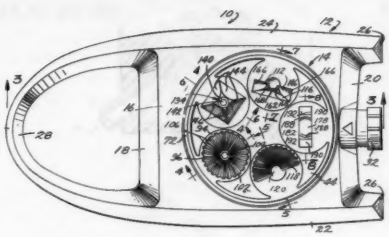
TURRET TYPE SPRINKLER WITH IMPROVED TURRET ASSEMBLY

Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Continuation of Ser. No. 20,925, Mar. 15, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,605

Int. Cl.³ B05B *1/16*

U.S. Cl. 239—394 **21 Claims**



17. A spray head for distributing water in a strip ground pattern comprising a spray head structure having a generally vertically extending water inlet, interior water engaging surface means for receiving the water from said inlet and directing the same in at least one jet extending horizontally outwardly and slightly upwardly, and an upwardly open pattern defining surface means disposed in a position such that the lower portion of the jet engages the same so as to cause the lower portion of the jet to lose its integrity with the remainder of the jet and to progressively fall out along the ground in a strip pattern as the jet moves outwardly beyond said pattern defining surface means.

4,347,982

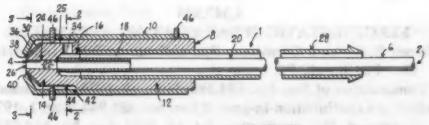
OIL BURNER NOZZLE

Donald G. Wright, Rockville Center, N.Y., assignor to Adelphi Research Center, Inc., Garden City, N.Y.

Filed Jul. 2, 1979, Ser. No. 54,244

Int. Cl.³ B05B *7/10*

U.S. Cl. 239—405 **5 Claims**



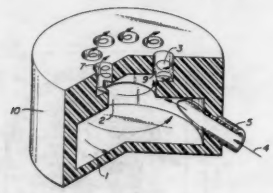
1. A burner nozzle capable of atomizing a liquid fuel containing combustible particulates, comprising a barrel member having an unrestricted inner passage extending to the exterior of said nozzle for conveying said fuel to an outlet located exteriorly of said nozzle, said barrel member having an outer passageway disposed around said inner passage for conveying atomizing vapor towards the forward end portion of said barrel member and outward laterally therefrom, and means including a sleeve member held over said barrel member and forming with said forward portion a converging chamber extending to said outlet to direct said vapor across said outlet for atomizing said fuel exteriorly of said nozzle.

4,347,983

HYPERBOLIC FREQUENCY MODULATION RELATED TO AERO/HYDRODYNAMIC FLOW SYSTEMS

Conrad A. Bodai, Davis, Calif., assignor to Sontek Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 4,818, Jan. 19, 1979, Pat. No. 4,253,508. This application Jan. 9, 1980, Ser. No. 110,670
The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.
Int. Cl.³ B05B *1/34, 17/06*
U.S. Cl. 239—466 **28 Claims**



1. A frequency modulator comprising:
(a) a swirl chamber having a substantially circular cross-section and further having means for the feeding of a fluid to the interior of the swirl chamber to impart a rotational motion to the fluid;
(b) a compression chamber also having a substantially circular cross-section disposed downstream of the swirl chamber and in substantially coaxial alignment therewith wherein said compression chamber has a cross-section which is equal to or smaller than the cross-section of said swirl chamber; and
(c) at least two modulator cavities also having substantially circular cross-sections which are in fluid communication with and disposed downstream of said compression chamber and which communicate with the compression chamber by ports tangential to the modulator cavities.

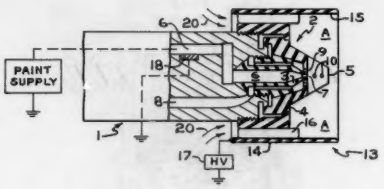
4,347,984

ELECTROSTATIC SPRAY COATING APPARATUS

James E. Sickles, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 634,386, Nov. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 456,944, Apr. 1, 1974, abandoned. This application Jul. 12, 1977, Ser. No. 814,953
Int. Cl.³ B05B *5/00*
U.S. Cl. 239—707 **25 Claims**

1. An inductive charging electrostatic spray coating apparatus comprising:
an electrically non-conductive spray nozzle including both air and liquid discharge ports arranged in produce air-atomized liquid spray particles;
a substantially cylindrical tube of dielectric material;
means securing said tube exteriorly of said discharge ports and substantially coaxial with the axis of flow of spray particles discharged from said discharge ports;
a charging zone formed between said tube and said spray nozzle discharge ports;
means forming an electrically conductive layer on the interior surface of said tube, at least a portion of said conductive layer passing through a plane perpendicular to the axis of flow of spray particles, said plane passing through at least one of said discharge ports; and
means applying an electrical potential between the liquid discharged from said liquid discharge port and said electrically conductive layer to create within said charging zone an electrostatic field having an average potential gradient sufficient to produce induction charging on air-atomized liquid particles as said particles are from said spray nozzle into said charging zone, but insufficient to produce corona effects.

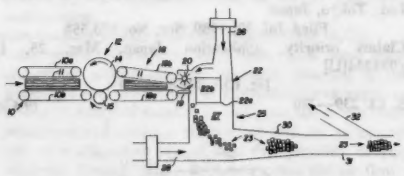


4,347,985

MANUFACTURE OF GLASS FIBRE BLOWING WOOL

Robert B. Simpson, Sarnia Township, Lambton County, Canada, assignor to Fiberglas Canada Inc., Toronto, Canada

Filed Oct. 11, 1979, Ser. No. 83,968
Claims priority, application Canada, Aug. 3, 1979, 333125
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—1 **10 Claims**



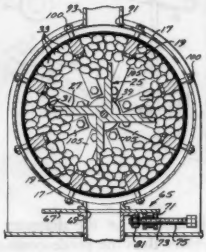
1. A method of producing blowing wool from bonded, laminated, glass fibre material, comprising the steps of:
cutting the glass fibre material into a plurality of strips;
cutting said strips across the lengths thereof to form individual substantially rectangular shaped cut pieces of said glass fibre material;
delaminating said individual cut pieces into smaller pieces having the shape of rectangular parallelepipeds by subjecting said cut pieces to an air stream; and
subsequently controlling the velocity of said air stream and the movement of the pieces treated thereby to avoid excessive delamination of said smaller pieces.

4,347,986

SELF-ATTRITIONING PULVERIZER

Lawrence D. Haddon, 350 East Ave., R 4, Palmdale, Calif. 93550

Filed Jan. 2, 1980, Ser. No. 109,050
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—74 **11 Claims**



1. A self-attritioning pulverizer for reducing chunk material to a powder and comprising:

a cylindrical shell including a peripheral wall and front and back end walls, said front wall being formed with a feed opening and said peripheral wall being formed with a outlet opening;

cylindrical screen means received in telescopical relationship in said shell and open on at least the end facing said feed opening, said screen means cooperating with said shell to form an annular screened particle collection chamber in communication with said outlet;

an axially disposed impeller received coaxially in said screen means and rotatably mounted from said back wall of said shell, said impeller including an axial shaft and a plurality of radially outwardly projecting blades terminating in radial outer ends;

an array of axial baffles spaced in a cylindrical pattern about said screen means and projecting radially inwardly therefrom to terminate in blunt edges, spaced radially outwardly of said radial outer ends of said blades, said baffles cooperating together to define therebetween an annular holding zone, and said blunt edges cooperating together to form a substantially cylindrically shaped outline defining an attrition interface for projection radially inwardly therepast of such chunks to cause any chunks held in said holding zone with the respective radially innermost surfaces thereof projecting radially inwardly past said attrition interface to be rubbed by confronting surfaces of the chunks circulated about by said impeller to thus reduce the held chunks and circulated chunks; and

drive means coupled with said impeller for rotation thereof whereby said chunks of material to be reduced may be fed progressively into said cylindrical screen means through said feed opening and said drive means actuated to rotate said impeller to cause said chunks to be orbited about by said impeller to be progressively thrown centrifugally outwardly into said holding zone to be retained by said baffles against orbiting and as said chunks build up in said holding zone the radially innermost surfaces of the chunks disposed radially inwardly in said zone will be held projecting radially inwardly past said interface and as further chunks are fed into said feed inlet, said further chunks will be orbited about a circular path defined by said radially innermost surfaces of the chunks retained by said baffles in said holding zone to thus wear the orbiting chunks against the retained chunks thus reducing said chunks against one another and causing the reduced particles to move radially outwardly between said retained chunks and through said screen means to be received in said collection chamber for removal through said outlet.

4,347,987

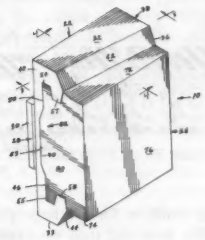
Patent Not Issued For This Number

4,347,988

ANVIL ASSEMBLY FOR VERTICAL SHAFT CENTRIFUGAL IMPACT CRUSHING MACHINE

Kenneth D. Warren, and Gregory G. Tenold, both of Spokane, Wash., assignors to Spokane Crusher Mfg. Co., Spokane, Wash.

Filed Jun. 18, 1980, Ser. No. 160,811
Int. Cl.³ B02C *19/06*
U.S. Cl. 241—300 **6 Claims**



1. An anvil assembly for mounting to a stationary bracket to position the anvil assembly in the path of material thrown from a rotating horizontal turntable of a vertical shaft centrifugal impact crushing machine to cause the material to disintegrate as the material impacts against the anvil assembly; comprising:

a wedge-shaped supporting base member having a bottom face, a top face, a back face, an inclined front face, an upstream side face and a downstream side face;

said front face being at an inclined acute angle with respect to the back face tapering inward from the upstream side face to the downstream side face;

said back face of the base member having bracket mounting means projecting therefrom adapted to secure the anvil assembly to the stationary bracket;

said front face of the base member having a horizontal female dovetail channel formed therein extending at the acute angle with respect to back face and parallel with the front face with an entrance opening in the upstream side face;

said base member having abutment surface formed adjacent the upstream face;

a wedge-shaped wear resistant member having a bottom face, a top face, a back face, a front face, an upstream side face and a downstream side face;

said back face being at an inclined acute angle with respect to the front face tapering inward from the downstream side face to the upstream side face;

said back face of the wear resistant member having a horizontal male dovetail projection formed thereon complementary to the female dovetail groove for enabling the male dovetail projection to slide into the female dovetail groove through the entrance opening to enable the wear resistant member to overface the base member with the front face of the wear resistant member facing the turntable to receive the material; and

said wear resistant member having a shoulder surface for engaging the abutment surface of the base member to limit the sliding movement of the wear resistant member with respect to the base member and to align the wear resistant member centrally on the base member.

4,347,989

SPINNING MACHINE FOR SYNTHETIC THREADS

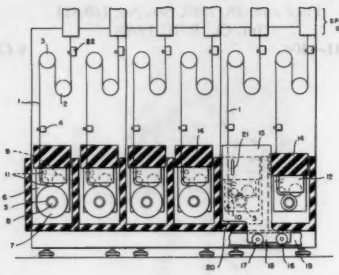
Werner Pieper, Radevormwald, and Reinhard Worpenberg, Remscheid, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,912

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002849

Int. Cl.³ B65H *54/20*

U.S. Cl. 242—35.5 R 8 Claims



1. In a spinning machine for synthetic fibers, including a plurality of spinning units and their associated winding units arranged side by side adjacent one another over the length of the machine, each winding unit adapted to receive thread for winding from a thread feed plane located at one side of each unit, and further including soundproofing means partly enclosing each winding unit, while leaving the front face of each winding unit exposed for access to the individual winding elements, the improvement which comprises:

a soundproofing screen having a size sufficient to extend across the exposed front face of at least one winding unit;

means to move said screen along the front of the machine; and

thread insertion means in said screen including an open-ended thread insertion slot extending longitudinally of the machine from the leading side edge of the screen which is located on the same side of each winding unit at its thread feed plane.

4,347,990

METHOD AND APPARATUS FOR STOPPING PACKAGES IN AUTOMATIC WINDER

Kenji Ohashi, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

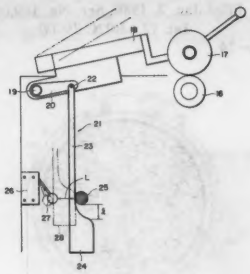
Filed Jul. 18, 1980, Ser. No. 170,069

Claims priority, application Japan, Jul. 19, 1979, 54-92351

Int. Cl.³ B65H *63/02*

U.S. Cl. 242—36 9 Claims

1. A method for stopping a winding package driven under contact with the surface of a driven drum in an automatic winder comprising the steps of stopping the drum, sensing whether the diameter of the winding package is at or above a predetermined diameter and separately stopping the winding



package when it is sensed that the diameter of the winding package is at or greater than the predetermined diameter.

4,347,991

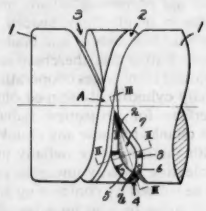
GROOVED TRAVERSE DRUM FOR USE IN DRUM WINDER

Masao Mino, and Takeshi Ohno, both of Yao, Japan, assignors to Kabushiki Kaisha Mino Seisakusho, Yao, Japan

Filed Jul. 6, 1978, Ser. No. 922,494

Int. Cl.³ B65H *54/28, 54/48*

U.S. Cl. 242—43.2 4 Claims

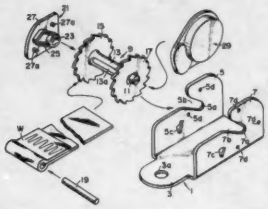


1. A grooved traverse drum for use in a drum winder, said drum including a spiral yarn guide groove formed in the peripheral surface thereof, said spiral groove having a deep portion and a shallow portion crossing said deep portion, said shallow portion being interrupted where it crosses said deep portion defining an interrupted portion, said yarn guide groove having two sides, one of which guides said yarn in said groove, wherein said shallow portion of said yarn guide groove includes a widened portion extending from the interrupted portion thereof in the longitudinal direction of said yarn guide groove for a distance greater than the width of the widened portion, said widened portion being formed in the side of said yarn guide groove which is opposite said one side, said widened portion being formed contiguously with the remaining portion of said yarn guide groove, thereby minimizing the change of direction of a piece of yarn which passes through said widened portion, said widened portion including a recess formed in the bottom thereof wherein the yarn in the bottom of said widened portion bridges across said recess.

4,347,992
WEBBING TAKE-UP DEVICE

Hironobu Imai, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,916
Claims priority, application Japan, Aug. 10, 1979, 54-109452[U]
Int. Cl.³ B65H 75/18
U.S. Cl. 242—68.4 10 Claims

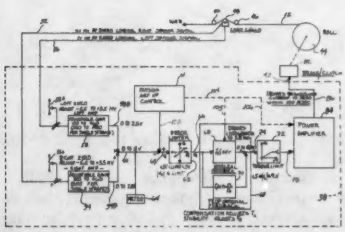


1. A webbing take-up device having a base member with opposed side plate portions, a reel assembly carried between the side plate portions and mounting means for mounting opposite ends of the reel assembly in the respective side plate portions, wherein the mounting means for at least one end of the reel assembly comprises a cut-away formed in the respective side plate portion from the outer periphery thereof, and a bushing member fitting in the cut-away, the bushing member including an annular portion in the form of an uninterrupted circular ring receiving said one end of the reel assembly, first and second rib portions extending from the annular portion, the rib portions fitting between edges of the side plate portion defining the cut-away, and a web portion between the rib portions connecting the rib portions to the annular portion, the mounting means including means for fixing the bushing member lengthwise in the cut-away and means for preventing lateral removal of the bushing member from the cut-away, the cut-away having a closed end and extending from the closed end to the outer periphery of the side plate portion in a direction generally opposite the direction of webbing draw-out.

4,347,993
TENSION MONITOR MEANS AND SYSTEM

Michael R. Leonard, Manchester, Mo., assignor to W. J. Industries, Incorporated, Fenton, Mo.

Filed Nov. 6, 1979, Ser. No. 91,738
Int. Cl.³ B65H 23/04
U.S. Cl. 242—75.51 56 Claims

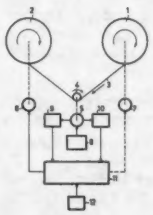


1. A tension control device for a web handling system including a roller over which a web of material passes, comprising means associated with the roller including transducer means for detecting the tension of the web passing over the roller and for producing tension monitor responses that very therewith, means operatively connected to the web to move the web over the roller, controllable force applying means for applying tensional forces to the web, said controllable force applying means including inductive means, and controller means to control the tension on the web, said controller means including means for establishing a desired web tension and for producing a signal representative thereof, comparison means responsive to said tension monitor responses and to the signal representative of the desired web tension for controlling the amount of tensional force applied to the web, said comparison means including means for receiving said tension monitor responses and the signal representative of the desired web tension and for producing responses representing the differences between the tension detected and the desired web tension, error limiter means responsive to said difference responses to produce error limiter responses, said error limiter means having an input connected to receive said difference responses and an output at which said error limiter responses are produced, said error limiter means passing positive difference responses less than or equal to a predetermined positive value and limiting the magnitude of the difference responses greater than the predetermined positive value, means operatively connected to said output of said error limiter means to integrate said error limiter responses and to produce integrated error limiter outputs, and signal conditioning means connected to operatively apply such integrated error limiter outputs to the force applying means to control the amount of tensional force applied to the web by the force applying means, said signal conditioning means including amplifier means having a control input operatively connected to receive said integrated error limiter outputs and an output operatively connected to said inductive means, energy dissipation means, and means connecting said energy dissipation means to the inductive means to permit excess energy associated with the inductive means to be rapidly dissipated when power from such amplifier means to said inductive means is interrupted.

4,347,994
MAGNETIC TAPE DRIVE ARRANGEMENT

Jacob de Boer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 202,035
Claims priority, application Netherlands, Nov. 26, 1979, 7908559
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—203 5 Claims



1. A magnetic tape drive arrangement without pressure roller, which arrangement comprises:

a capstan,

a capstan drive motor,

a magnetic tape transport device for feeding and taking up a magnetic tape under tension along the capstan by means of at least one winding motor,

an energizing circuit, connected to the capstan motor, for driving the magnetic tape with the desired speed by means of the capstan,

a control signal generator for controlling at least said winding motor in such a way that the magnetic tape can be driven by the capstan without slipping past the capstan, and

a motor current detector, which is connected to the control signal generator, for detecting the current consumed by the capstan drive motor and for supplying a signal, which is proportional to said motor current, to the control signal generator, characterized by

a reference source, which is connected to the control signal generator, for supplying a reference signal which is proportional to the no-load current of the capstan drive motor, which reference signal is deducted from the signal supplied by the motor current detector, and

an acceleration detector, which is connected to the control signal generator, for detecting the acceleration of the capstan and supplying an acceleration signal, which is proportional to said acceleration and which is deducted from the signal supplied by the motor current detector.

4,347,995

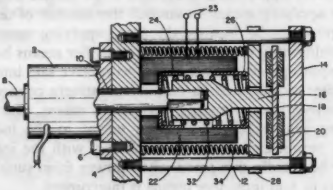
BI-DIRECTIONAL TAPE REEL BRAKE

Walter J. Mahnken, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 22, 1980, Ser. No. 218,954

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—204 **10 Claims**



1. A tape reel brake comprising:

a tape reel motor means having a motor shaft,

a brake pad means connected to said motor shaft,

a brake plate means,

a first spring means for urging said brake plate means against said brake pad means,

a second spring means for urging said brake plate means against said brake pad means to supplement said first spring means to produce a net braking effect by said brake pad means and

means for altering the spring pressure exerted by said second spring means from a first spring pressure to a second spring pressure to produce a first and a second net braking effect by said brake pad means, respectively.

4,347,996

SPIN-STABILIZED PROJECTILE AND GUIDANCE SYSTEM THEREFOR

Vincent A. Grosso, Hopkinton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 22, 1980, Ser. No. 152,284

Int. Cl.³ F41G *7/26*

U.S. Cl. 244—3.16 **5 Claims**

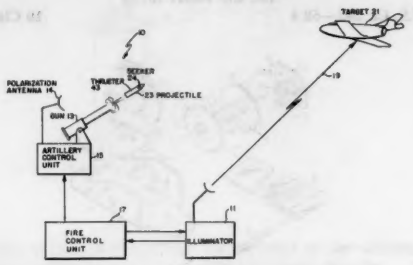
1. A guidance system for a spinning projectile, such projectile being in flight toward a target in motion, such system comprising:

(a) ground-based means for illuminating the spinning projectile with a linearly polarized radio frequency signal;

(b) radio frequency signal receiving means including a linearly polarized antenna affixed to, and rotating with, the spinning projectile for establishing a roll reference when the linearly polarized antenna is aligned with the linearly polarized radio frequency signal;

(c) a seeker for continuously measuring the line-of-sight angle between the centerline of the spinning projectile and the line-of-sight to the target, such seeker having its boresight aligned with such centerline;

(d) signal processing means, responsive to the outputs of the radio frequency signal receiving means and the seeker, for determining, in a first plane defined by the velocity vector of the spinning projectile and a line from the center of gravity of such projectile to the target and in a second plane orthogonal to the first plane, the rates of change of the line-of-sight between such projectile and target; and



(e) course correction means carried on the spinning projectile to maintain the vector sum of the rates of change of the line-of-sight in the first and the second plane below a preset value during intercept.

4,347,997

HELICOPTERS

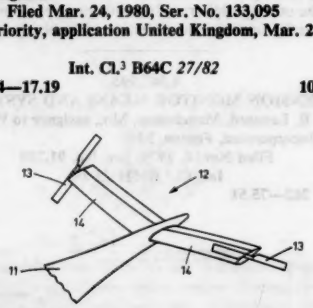
Geoffrey M. Byham, Yeovil, and Ronald V. Smith, Sherborne, both of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Mar. 24, 1980, Ser. No. 133,095

Claims priority, application United Kingdom, Mar. 23, 1979, 7910385

Int. Cl.³ B64C *27/82*

U.S. Cl. 244—17.19 **10 Claims**



1. An improved helicopter having increased deceleration comprising:

a main sustaining rotor system;

a pair of auxiliary rotors drivingly coupled to the sustaining rotor system and having adjustable pitch settings, said auxiliary rotors arranged to produce thrusts for control purposes; and

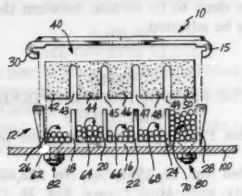
a control means for adjusting the pitch settings of said auxiliary rotors to provide additive control thrust forces when driving torque is applied to said sustaining rotor system and to provide opposed thrust forces for absorbing power from said sustaining rotor system during deceleration of the helicopter thereby increasing the deceleration effect on the helicopter.

4,347,998

MULTIPLE WIRE BUNDLE SUPPORT ASSEMBLY

Thomas J. Loree, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 15, 1981, Ser. No. 254,798
Int. Cl.³ F16L 3/22; H02G 3/02
U.S. Cl. 248—68 R 2 Claims



1. An assembly for mounting a plurality of wire bundles on a structure comprising in combination:

a cover member including a pair of inturned lip portions at respective ends of said cover member;

a multichanneled base member for receiving a corresponding plurality of wire bundles in respective channels of said base member;

a resilient insert comprising a plurality of foam cushions adapted for insertion respectively in said plurality of channels to retain said wire bundles; and,

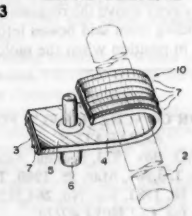
said multichanneled base member having first and second end wall portions, each of said end wall portions having a pair of recesses adapted to receive corresponding pairs of said inturned lip portions.

4,347,999

HOLDER FOR A WIRE MEMBER

Toshio Sato, Yokohama, and Yasuyuki Ogawa, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited and Kato Hatsujo Kaisha Limited, both of Yokohama, Japan

Filed Feb. 22, 1980, Ser. No. 123,689
Claims priority, application Japan, Feb. 26, 1979, 54/22882[U]
Int. Cl.³ F16L 3/12
U.S. Cl. 248—73 9 Claims



1. A holder for firmly holding a wire member comprising:

a clip including a head and a leg extending from said head; and

a long and thin holding member coated with a coating material on substantially the entire area of the front side, the back side, and both edges thereof, said holding member having a through hole in one end portion thereof through which said clip leg is inserted, said holding member being bendable for holding the wire member,

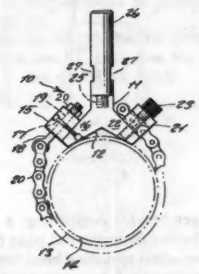
said coated material on said holding member back side having an irregular exterior surface, said irregular surface having a jagged saw-tooth profile running across the width of said holding member, and having parallel saw-tooth peaks and parallel saw-tooth valleys running along the length of said holding member.

4,348,000

DIAL INDICATOR HOLDER

Paul J. Hanner, 510 Heckman Ave., Nazareth, Pa. 18064

Filed Dec. 11, 1979, Ser. No. 102,855
Int. Cl.³ G01B 3/30
U.S. Cl. 248—231 1 Claim



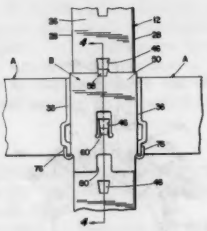
1. A chain compression "V" block dial indicator holder comprising, in combination, a "V" block having a first and a second leg, a pair of anchor of anchor blocks attached to said "V" block at said legs thereof, one of said anchor blocks having a pair of holes and a pair of screws for insertion in said pair of holes, and said first leg having a pair of threaded holes for receiving said pair of screws of said one anchor block to thereby attach said one anchor block to said "V" block, said one anchor block also having a longitudinal opening formed therethrough perpendicular to the direction of each of said pair of holes; the other of said pair of anchor blocks having a pair of holes and a pair of screws for insertion into said pair of holes of said other anchor block, said second leg having a pair of threaded holes for receiving therein said pair of screws of said other anchor block, to thereby attach said other anchor block to said "V" block, said other anchor block also having a transverse threaded opening parallel with each of said pair of openings of said other anchor block, and a knurled screw for insertion into said transverse threaded opening, said second leg having a passageway in alignment with said transverse threaded opening of said other anchor block, said passageway passing entirely through said second leg adjacent said other anchor block for receiving therethrough a portion of said knurled screw; a roller chain having a first end for attachment to said one anchor block; an eye bolt having its eye portion thereof affixed to said first end of said roller chain and a second end inserted through said longitudinal opening of said one anchor block, and a nut for tightening said eye bolt to said one anchor block; said chain having a second end remote from said first end and defining therebetween a series of openings between the links of said chain, said knurled screw passing through one of said series of openings of said chain adjacent the second end thereof for holding said chain fast to said other anchor block; said "V" block further comprising an upwardly extending stem removably attached thereto, said stem having a pair of oppositely disposed flat recessed portions for easy gripping by a tool, said stem being used for supporting thereon a dial indicator; and said other anchor block having a notch extending therethrough in a direction parallel with said second leg of said "V" block and perpendicular to said pair of holes of said other anchor block, whereby alignment of a shaft to another shaft may be accurately obtained.

4,348,001

SHELF SUPPORT BRACKET

Mark H. Baldwin, Cincinnati, Ohio, assignor to NesTier Corporation, Cincinnati, Ohio

Filed Sep. 22, 1980, Ser. No. 189,197
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—243 10 Claims



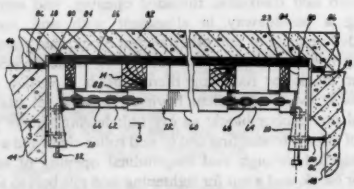
1. A shelf hanger bracket comprising: a substantially flat rectangular plate having plate top and plate bottom edges and opposite side edges, a first mounting hook bent from said plate top edge and extending back toward said plate bottom edge, said first mounting hook being located substantially centrally between said side edges, a second mounting hook bent from said plate intermediate said plate top and said plate bottom edges in the same direction as said first mounting hook and being located substantially centrally between said side edges, flanges bent from said side edges, extending out from said plate in the same direction as said first and said second mounting hooks and further extending substantially perpendicular to said plate, said flanges having shelf support hooks adjacent said plate bottom edge, said shelf support hooks having saddles facing upwardly toward said plate top edge and having saddle axes extending substantially perpendicular to said plate.

4,348,002

HANGER FOR CONCRETE DECK FORMING APPARATUS

Everett A. Eyden, P.O. Box 1873, Sedona, Ariz. 86336

Division of Ser. No. 133,904, Mar. 25, 1980. This application May 18, 1981, Ser. No. 265,036
Int. Cl.³ F04G *11/00*
U.S. Cl. 249—19 4 Claims



1. A hanger for use with removable deck forming apparatus to suspend temporarily ledgers intermediate support elements defining the span of the deck to be formed, said hanger comprising in combination:

(a) a channel chase having a base and opposed sides;

(b) a threadedly apertured load transfer plate secured to said channel chase;

(c) a threaded rod in threaded engagement with the aperture of said load transfer plate, said rod being located in general alignment with the longitudinal axis of said channel chase;

(d) an apertured ledger support plate penetrably mounted upon said rod for supporting an end of a ledger;

(e) means for translating said ledger support plate longitudinally within said channel chase upon rotation of said rod;

(f) means for suspending said hanger from the support element; and

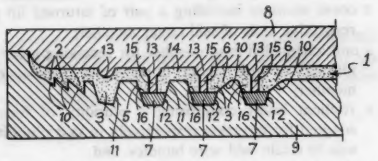
(g) means for rotating said rod from either the top or bottom of said rod to raise and lower said ledger support plate and the supported end of the ledger whereby the grade elevation of the deck to be formed between the support elements may be adjusted.

4,348,003

MOLD FOR THE PRODUCTION OF SPIKED SOLES FOR SPORT SHOES

Charles Beneteau, Pouzauges, France, assignor to Patrick S.A., France

Filed Apr. 13, 1981, Ser. No. 253,882
Claims priority, application France, Apr. 28, 1980, 80 09538
Int. Cl.³ B29C *1/14;* B29D *3/00*
U.S. Cl. 249—96 3 Claims



1. A mold for forming a spiked sole for a sport shoe wherein the spikes are formed from a hard, stress-resistant plastic material that is chemically bonded or fused to a supple sole, comprising:

(a) a first mold portion defining a cavity for forming the sole, the mold also defining a plurality of recesses in the cavity, into which recesses the spikes are placed, the recesses having the same cross-sectional shape as the spikes such that the spikes sealingly contact the recesses about their peripheral surfaces to prevent molding material passing therebetween; and

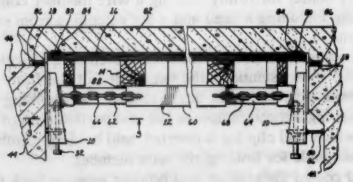
(b) a second mold portion fitting over the first mold portion, the second mold portion having a plurality of bosses projecting into the cavity above the recesses and a plurality of push rods extending from said bosses into the recesses to hold the spikes in position when the mold is assembled.

4,348,004

LEDGER FOR CONCRETE DECK FORMING APPARATUS

Everett A. Eyden, P.O. Box 1873, Sedona, Ariz. 86336

Division of Ser. No. 133,904, Mar. 25, 1980. This application May 18, 1981, Ser. No. 264,352
Int. Cl.³ H01J *40/14*
U.S. Cl. 249—210 6 Claims



1. A ledger for use with deck forming apparatus to support deck joists and decking intermediate opposed hanger pairs suspended from support members defining the span of the deck to be formed, said ledger comprising in combination:

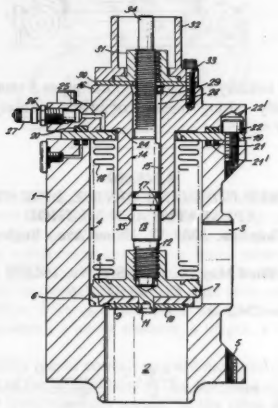
(a) telescoping members extendable and contractable to a length commensurate with the span between the support members;
(b) means for limiting the extension of said members relative to one another to ensure overlap therebetween; and
(c) means disposed at each end of said ledger for engaging one of the hangers.

4,348,005

VALVES FOR FLUIDS

Alan Eaton, Lymm; William T. Mitchell, Thirsk, and Alec Sunderland, Weymouth, all of England, assignors to British Nuclear Fuels Limited, Cheshire, England

Filed Sep. 28, 1972, Ser. No. 293,663
Claims priority, application United Kingdom, Oct. 1, 1971, 45902/71
Int. Cl.³ F16C 31/44
U.S. Cl. 251—268 2 Claims



1. A valve for vacuum applications and of the kind which is provided with a bellows for sealing between a longitudinally movable valve closure member and a stationary body of the valve which carries a seat upon which the valve closure member is engaged to close the valve, characterised in that the valve also includes

a bellows mounting member to which one end of the valve bellows is sealed, the other end of the bellows being sealed to the valve closure member;

two separate portions of the valve body between which said bellows mounting member is interposed;

first sealing means between said bellows mounting member and said valve body portions, said first sealing means comprising two 'O' ring seals with an interspace between the seals for leak testing, such seals lying between said bellows mounting member and one of said valve body portions and constituting a back-up for helping to retain leak tightness of the valve, and said first sealing means further comprising a ring seal lying beween said bellows mounting member and the other of said valve body portions, with an interspace provided between the bellows and said ring seal for leak testing, said ring seal constituting a back-up for helping to retain leak tightness of the valve in the event the bellows should fail;

a valve operating member secured to the valve closure member and capable of longitudinal movement in a bore in one of the valve body portions;

second sealing means effective between said valve operating member and said bore, said second sealing means comprising a pair of 'O' ring seals mounted in grooves in said valve operating member for contacting said bore;

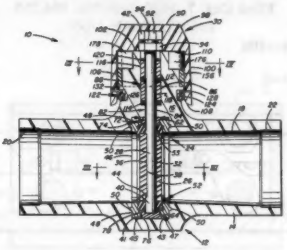
and a rotatable member held against longitudinal movement in screwthreaded engagement with the valve operating member over a length thereof at the opposite side of the last-named sealing means form said valve closure member, for moving by rotation of said rotatable member said valve closure member between 'valve open' and 'valve closed' positions.

4,348,006

PLASTIC VALVE ASSEMBLY

Edward L. Schmitt, Pittsburgh; Steven J. Caroleo, McKees Rocks; Charles W. Bolam, and Richard W. Conley, both of Pittsburgh, all of Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Continuation of Ser. No. 58,785, Jul. 19, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 224,203
Int. Cl.³ F16K 1/226
U.S. Cl. 251—288 20 Claims



11. A valve assembly comprising,

a valve body of plastic material,

said valve body having a conduit portion and an annular portion extending upwardly from said conduit portion,

a passageway extending through said conduit portion for the conveyance of fluid through said conduit,

a valve seat positioned in said passageway and secured to said conduit portion surrounding said passageway,

said valve seat including a metallic sleeve member,

said metallic sleeve having an outer peripheral edge,

a plurality of circumferential grooves extending around said metallic sleeve on said outer peripheral edge,

a resilient, expandable annular seal member positioned in each of said grooves, said seal members being undersized with respect to said grooves so that said seal members are stretched when in position in said grooves to securely grip said metallic sleeve member and prevent displacement of said seal members from said grooves during molding of said valve body around said metallic sleeve,

said valve body plastic material being molded in surrounding relation with said seal members to embed said seal members in said plastic material to form a fluid tight seal between said metallic sleeve member and said valve body conduit portion,

an annular resilient sleeve insert secured to said metallic sleeve member and positioned within said passageway,

a valve disc centrally positioned in said conduit portion for movement into and out of sealing engagement with said annular resilient sleeve insert to effect closing and opening of said valve assembly,

actuating means supported by said valve body annular portion and connected to said valve disc for moving said valve disc between an open position permitting fluid flow through said passageway and a closed position sealingly engaging said valve disc with said annular resilient sleeve insert to interrupt fluid flow through said passageway,

a metal support sleeve positioned in surrounding relation with said valve body annular portion to reinforce said valve body annular portion,

interlocking means on said metal support sleeve and said

valve body annular portion for nonrotatably connecting said metal support sleeve to said valve body annular portion,

said valve body annular portion having at least one vertical planar surface, and

said metal support sleeve having a tab embedded in said plastic material of said valve body annular portion and abutting said vertical planar surface to permit the rotational forces generated upon turning of said actuating means to be transmitted from said valve body annular portion to said metal support sleeve.

4,348,007

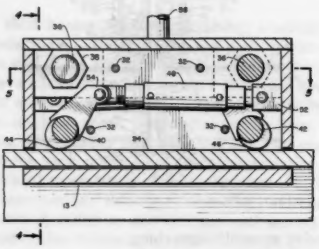
GRIPPER SYSTEM FOR MOVING DRILLING RIGS

Fred Malzacher, 1555 Callens Rd., Ventura, Calif. 93003

Filed Oct. 7, 1980, Ser. No. 194,755

Int. Cl.³ B66F *1/00*

U.S. Cl. 254—106 **10 Claims**



1. A gripper system for moving drilling rigs supported on flanged skid bases of a drilling platform comprising;

clamping means for clamping the flanges of said skid base;

said clamping means include a pair of rotatable eccentric cam means;

hydraulic cam locking means for rotating and holding said eccentric cam means in clamping engagement with said flanges of said skid base;

said hydraulic cam locking means adapted to rotate said pair of eccentric cam means in opposite directions so that their clamping forces are in opposition;

hydraulic skidding jack means connecting said hydraulic cam locking means to a saddle of said drilling rig for moving said drilling rig while said hydraulic cam locking means is securely clamped to said skid base.

4,348,008

LIFTING APPARATUS

Mitsuhiro Kishi, 1320 Mizuhonocho, Ashikaga-shi, Tochigi-Pref.,, Japan

Filed May 9, 1980, Ser. No. 148,351

Int. Cl.³ B66F *3/22*

U.S. Cl. 254—122 **5 Claims**

1. A lifting apparatus comprising

a carriage,

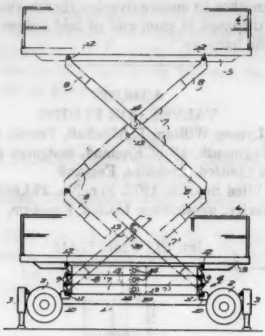
a pantograph comprising a plurality of X-link units provided on said carriage,

a platform provided on said pantograph,

each of said X-link units comprising a pair of outer pipes rotatably connected to each other at a central portion to form an X-link and a pair of inner pipes slidably inserted into each of said outer pipes from opposite ends thereof,

an end of said inner pipes of a lowermost X-link unit being connected to said carriage and an end of said inner pipes of an uppermost X-link unit being connected to said platform, and

means for extending and retracting said inner pipes,



means for initially raising said outer pipes a small height,

said initially raising means comprises a rotary eccentric member.

4,348,009

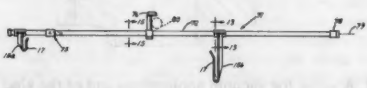
LOAD PICKUP COUPLING DEVICE, LINE STRINGING APPARATUS AND METHOD

Claude L. Chapman, 3300 W. Union Ave., Englewood, Colo. 80110

Filed May 30, 1980, Ser. No. 154,878

Int. Cl.³ B66D *1/36*

U.S. Cl. 254—134.3 R **13 Claims**



1. Stringing apparatus comprising:

a hoist line carried by an aircraft;

an elongated threading member having a leading end and a trailing end arranged to be passed through a window-like line-holding structure on a tower while suspended from above by said hoist line;

a threading line connected to said threading member rearwardly of said leading end;

a coupling between said hoist line and said threading member having interfitting, releasable, male and female coupling portions, one of said coupling portions being connected to the lower end of said hoist line and the other of said coupling portions being asscociated with said threading member to suspend said threading member from said hoist line and to releasably connect said threading member to said hoist line for the directed movement of said threading member through said structure while suspended from above, said other coupling portion including a leading coupling part at a forward position on said threading member and a trailing coupling part rearwardly of and spaced from said leading coupling part; and

tower catch means for said threading member releasably fastening said threading member to said tower after said hoist line is released from said threading member, said tower catch means including a front tower catch rearwardly of said leading coupling part and a rear tower catch forwardly of said trailing coupling part, said hoist line being first coupled to said leading coupling part and said front tower catch engaging the tower, the hoist line being released from said leading coupling part and cou-

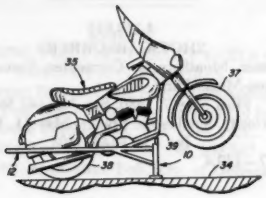
pled to said trailing coupling part for the movement of the leading end of said threading member and leading coupling part through said structure, said rear tower catch engaging the tower, said hoist line being released from said trailing coupling part and coupled to said leading coupling part, said threading member and threading line being moved through said structure while suspended from said aircraft.

4,348,010

MOTORCYCLE JACK

David H. Baxter, 3049 N. 52nd Pkwy., Phoenix, Ariz. 85031

Filed Nov. 17, 1980, Ser. No. 207,231
Int. Cl.³ B66F 7/22
U.S. Cl. 254—131 **6 Claims**



1. A jack for lifting and for supporting a motorcycle so that one of the two wheels of the motorcycle is elevated above a planar supporting surface while the other wheel contacts said surface, said motorcycle including a frame intermediate the two wheels, said frame having a minimum clearance between the frame and the supporting surface, said jack comprising:

a lifting frame defining a plane, said lifting frame having an upper element, a lower element, a length, a width and a height,

a substantially planar contact element mounted on the upper element of the lifting frame so that the plane of the contact element is substantially parallel to the plane of the lifting frame and is adapted to establish substantially linear engagement with the underside of the frame of a motorcycle to be lifted and supported;

a foot having a substantially planar bottom surface, said foot being mounted on the lower element of the lifting frame so that the plane of the bottom surface of the foot is substantially perpendicular to the plane of the lifting frame; said bottom surface of the foot having a length substantially equal to the length of the lifting frame and a width substantially greater than the width of the frame; and elongate handle means having a substantially linear axis connected to the upper element of the lifting frame so that the axis of the handle means is substantially perpendicular to the plane of the lifting frame for rotating the contact element relative to the lower element of the lifting frame to lift and support a motorcycle, said motorcycle having one wheel engaging the support surface and its frame engaging the contact element; whereby, when the jack is supporting a motorcycle, the bottom surface of the foot is substantially in contact with the supporting surface and the handle means is spaced above the supporting surface and substantially parallel to said surface.

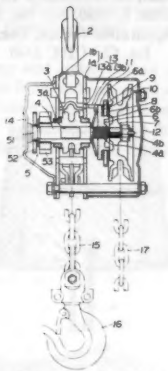
4,348,011

HOIST WITH IMPROVED OVERLOAD PROTECTION

Munenobu Honda, Osaka, Japan, assignor to Elephant Chain Block Co., Ltd., Osaka, Japan

Filed Mar. 31, 1980, Ser. No. 135,235
Claims priority, application Japan, Apr. 3, 1979, 54-44956[U]
Int. Cl.³ B66D 1/14
U.S. Cl. 254—350 **8 Claims**

1. A hoist comprising: a main body; means for hanging said body; a load sheave supported rotatably to said body; a chain engageable with said load sheave for lifting and lowering a load; power-actuating means for rotating said load sheave, said power-actuating means including a drive shaft, a disc hub spline connected to said drive shaft, a driving member screwably connected with said drive shaft, an anti-reverse-rotation plate supported to said disc hub for preventing said disc hub from rotating in a direction of moving said chain downwardly, and friction plates interposed between opposite surfaces of said disc hub and anti-reverse-rotation plate and between opposite



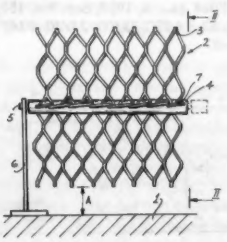
surfaces of said driving member and anti-reverse-rotation plate; and overload protection means including a locking mechanism provided between said disc hub and said body and a biasing means for biasing said disc hub toward said driving member; said driving member screwably moving toward said disc hub to move said disc hub axially of said drive shaft and actuate said locking mechanism when a load applied to said chain exceeds a predetermined value, whereby rotation of said disc hub is locked to halt the lifting of a load by said rotatably driven load sheave.

4,348,012

INTRUDER BARRIER

Thomas P. McLoughlin, Dublin, Ireland, assignor to MNJ Engineering Company Limited, Dublin, Ireland

Filed Jan. 24, 1979, Ser. No. 6,158
Claims priority, application Ireland, Jan. 25, 1978, 162/78; Jul. 11, 1978, 1388/78; Nov. 22, 1978, 2296/78
Int. Cl.³ E04H 17/00
U.S. Cl. 256—12 **12 Claims**



7. An intruder barrier for mounting on a surface of a wall comprising:

a scaling barrier rotatable about a longitudinal axis, said barrier being formed by a plurality of blades of semi-rigid expanded metal mesh material which deforms under load,

said blades being substantially equi-spaced circumferentially and radially arranged relative to the axis; and

a support framework for mounting the barrier on the wall with its longitudinal axis substantially parallel to the surface of the wall.

4,348,013

DEVICE OF REFRACTORY POROUS MATERIAL FOR BLOWING GAS INTO A BATH OF LIQUID METAL

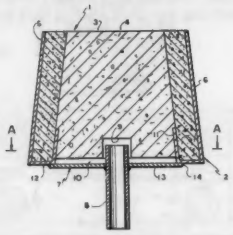
Jean-Claude Grosjean, Semecourt, and Roland Grave, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, St. Germain-en-Laye, France

Filed Dec. 5, 1980, Ser. No. 213,548

Claims priority, application France, Dec. 10, 1979, 79 30425

Int. Cl.³ C21C *5/48*

U.S. Cl. 266—220 **6 Claims**



1. A device of refractory porous material for blowing gas into a mass of molten metal comprising an outer metallic envelope of predetermined length having an open end and an opposite end closed by a bottom; a mass of refractory material which is porous at least at a central portion thereof substantially filling said envelope, said mass of refractory material having an end face adapted to contact the mass of molten metal and being located in one plane with said open end of said metallic envelope; means fluid-tightly extending through said bottom for feeding a gas under pressure towards the central portion of said mass so that the gas will pass through said central portion of said mass and through said open end of said envelope; and a deflector fluid-tightly connected to said bottom inwardly of said outer envelope and having a wall parallel to that of said envelope but having a length shorter than that predetermined length.

4,348,014

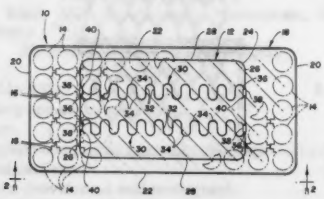
TORSION BAR SPRING AUXILIARY PANEL FOR BEDDING UNIT

Stanley Litkewycz, Brighton, Mich., assignor to Lear Siegler, Inc., Berkley, Mich.

Filed Jun. 6. 1980, Ser. No. 157,131

Int. Cl.³ A47C *25/00, 23/30;* F16F *13/00*

U.S. Cl. 267—87 **8 Claims**



1. In a bedding unit including a plurality of springs defining a load supporting surface and a generally rectangular border wire supported by the springs and defining longitudinal and lateral margins of the load supporting surface, an auxiliary panel comprising: a peripheral wire of a generally rectangular shape on the load supporting surface; said peripheral wire having opposite longitudinal portions and opposite lateral portions respectively extending parallel to the longitudinal and lateral margins defined by the border wire; said longitudinal portions of the peripheral wire being spaced longitudinally inward from the longitudinal margins defined by the border wire; a plurality of torsion bar springs extending between opposite portions of the peripheral wire; each torsion bar spring having oppositely opening loops including torsion bars and connecting portions extending between the torsion bars; and each torsion bar spring including distal end torsion bars adjacent which the torsion bar spring terminates and said end torsion bars being connected to the peripheral wire such that the auxiliary panel provides increased firmness to the load supporting surface.

4,348,015

SHOCK ABSORBERS

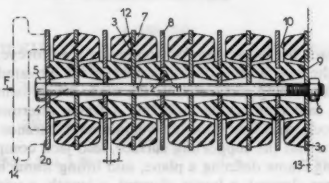
Michel Domer, Montigny les Cormeilles, France, assignor to Hutchinson-Mapa, Paris, France

Filed May 7, 1980, Ser. No. 147,346

Claims priority, application France, May 11, 1979, 79 12115

Int. Cl.³ F16F *3/08*

U.S. Cl. 267—140.4 **10 Claims**



1. Shock absorber comprising two concentric adjacent stacks, each stack having a plurality of metallic elements and elastic elements arranged with the metallic elements and elastic elements alternating with each other in each stack, the metallic elements and elastic elements arranged to bear one against the other upon compression of the shock absorber, said elastic elements of each stack being borne by the metallic elements of the other stack and wherein the elastic elements of the two stacks are constituted respectively of elastomers having different deformation and damping characteristics.

4,348,016

PROCESS AND DEVICE FOR SUSPENSION OF VEHICLE WHEELS

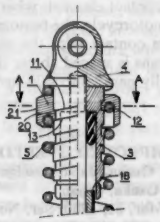
Lucien Milly, 1, rue du Cardinal Mercier, Paris, France

Filed Aug. 24, 1979, Ser. No. 69,495

Claims priority, application France, Sep. 6, 1978, 78 25588; May 21, 1979, 79 12849

Int. Cl.³ B60G *17/02;* B62K *25/10;* F16F *1/06, 1/12*

U.S. Cl. 267—177 **3 Claims**



1. A spring suspension device for a two-wheel vehicle with

a body comprising: an upper and a lower securing member to be connected, respectively, with the body of the vehicle and with a wheel of the vehicle; a hollow control sleeve depending from and solid with said upper member and a rod of said lower member telescopically received at one end within said sleeve, said rod having peripheral shoulder means thereon away from its telescoping free end; threads formed on the outer surface of said sleeve; a control nut having a bore with first and second threads therein, said first threads meshing with the threads of said sleeve; a suspension spring, about said lower member and sleeve, having one end abutting said shoulder means and another end abutting said upper member, and wherein said but has a body, said second threads being in the form of a through helical guideway in said body of said nut for the passage of the coils of said spring, said nut being slideable along said spring and sleeve to vary the active length of said spring.

4,348,017

BEARING FOR FACEPLATE PANELS OF COLOR-PICTURE TUBES

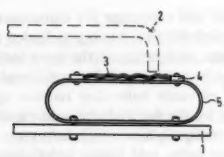
Wolfgang Schlayer, Stuttgart, and Herbert Hemminger, Schorndorf, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 12, 1980, Ser. No. 158,847

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939143

Int. Cl.³ B23Q 3/00

U.S. Cl. 269—296 **5 Claims**



1. A support assembly, comprising:

a rigid support member;

resilient link means mounted to said support member; and

wire fabric disposed on said resilient link means to provide a generally upwardly facing support surface wherein a portion of said link means is coextensive with and beneath said support surface.

4,348,018

METHOD AND APPARATUS FOR THE SEPARATION OF FLEXIBLE SHEETS FROM A STACK AND THEIR TRANSPORTATION TO A PROCESSING UNIT

Gaspar A. H. Bijttebier, Grote Heerweg, 64, B-8749 Waregem-Beveren, Belgium, and Jozef Vangheluwe, Roeselare, Belgium, assignors to Gaspar A. H. Bijttebier, Waregem-Beveren, Belgium

Filed Aug. 7, 1979, Ser. No. 64,514

Claims priority, application Netherlands, Aug. 10, 1978, 7808345

Int. Cl.³ B65H 3/22, 5/14, 9/04

U.S. Cl. 271—10 **39 Claims**

1. An apparatus for separating and transporting flexible sheets individually from a stack to at least one processing unit, comprising:

a frame having a vertically movable table for carrying said stack and a registering plate for receiving the sheets individually from said stack and for orienting each sheet for delivery to said at least one processing unit;

pick-up means for engaging the top sheet of said stack at an edge thereof and lifting the edge to a position spaced above said stack;

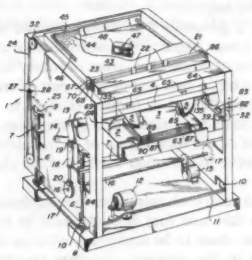
conveying means for transporting each sheet from said stack to said registering plate, said conveying means including two opposed endless chain means circulating in said frame at opposite sides thereof in paths having a portion over said stack and a portion over said registering plate, said conveying means also including means attached at each end to one of said chain means for gripping the top sheet of said stack by the lifted edge of the top sheet as the gripping means moves over said stack to remove the top sheet from the stack;

said gripping means comprising a horizontally disposed rotatable roller and a clamping member mounted parallel to said roller and relatively movable with respect to said roller for engaging said roller by moving into contact with said roller and thereby gripping a sheet to be conveyed; and,

means for rotating said roller at said registering plate to release the sheet from said roller and said clamping member and to deposit it on said registering plate.

5. An apparatus for separating and transporting flexible sheets individually from a stack to at least one processing unit, comprising:

a frame having a vertically movable table for carrying said



stack and a registering plate for receiving the sheets individually from said stack and for orienting each sheet for delivery to said at least one processing unit, said registering plate being situated vertically above said table in said frame;

pick-up means for engaging the top sheet of said stack at an edge thereof and lifting the edge to a position spaced above said stack; and,

conveying means for transporting each sheet from said stack of said registering plate, said conveying means including two opposed endless chain means circulating in said frame at opposite sides thereof in rectangular paths having a portion over said stack and a portion over said registering plate, said conveying means also including means attached at each end to one of said chain means for gripping the top sheet of said stack by the lifted edge of the top sheet as the gripping means moves over said stack to roll the top sheet off the stack;

said gripping means comprising a horizontally disposed lath and a clamping member mounted parallel to said lath for engaging and disengaging said lath and thereby gripping and releasing a sheet to be conveyed.

4,348,019

METHOD AND DEVICE FOR SEPARATING A SHEET FROM A STACK OF SHEETS

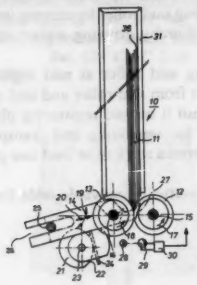
Emile F. Stievenart, Hoboken; Hendrik S. Plessers, Wychmaal, and Julianus J. Hellemans, Kontich, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 27, 1980, Ser. No. 134,553

Claims priority, application United Kingdom, Mar. 30, 1979, 7911119

Int. Cl.³ B65H *3/06, 3/50*

U.S. Cl. 271—10 **17 Claims**



1. A method for separating a sheet from a stack of sheets, comprising the steps of:

supporting a generally vertically oriented stack of sheets with the lower edges of the sheets therein abutting against the surface of at least two pairs of rotary traction surfaces forming a nip, a first one of each pair of traction surfaces having a coefficient of friction relative to one surface of the sheet to be separated that is greater than the coefficient of friction of the second one of each pair of traction surfaces relative to the other surface of the sheet to be separated,

imparting to each such pair of traction surfaces rotary movements so that said first one advances in the direction of feed of the sheet to be separated, whereas the second one advances in the opposite direction thereby causing the stack of sheets to be displaced to bring the lower edge of the outermost sheet which is supported by said first traction surface into said nip and advanced thereby over a predetermined distance therethrough,

after a predetermined length of said outermost sheet has passed beyond said nip, engaging the remainder of the sheets in said stack and lifting the same bodily upwardly away from said traction surfaces so that the remaining sheets in the stack are bodily separated from the sheet to be separated,

advancing the thus-separated sheet through and away from said pair of traction surfaces, and

returning the remaining sheets of the stack into lower edgewise abutment with said traction surfaces.

8. A device for separating a sheet from a stack of film sheets comprising:

at least two pairs of rotary traction surfaces forming a nip and supporting one edge of said stack, the first one of each pair of traction surfaces having a coefficient of friction relative to one surface of the sheet to be separated which is greater than the coefficient of friction of the second one of each pair of traction surfaces relative to the other surface of the sheet to be separated;

means for rotating said each pair of traction surfaces in directions such that the first one of each pair advances in the direction of feed of the sheet to be separated, whereas the second one of each pair of said traction surfaces advances in the opposite direction, thereby causing said stack of sheets to be displaced so that the lower edge of the outermost sheet which is supported by said first traction surface is directed into said nip and advanced thereby a predetermined distance therethrough; and

lifting means operable after the predetermined length of said outermost sheet has passed through said nip to engage the remainder of the stack and lift the same bodily so that the remaining sheets constituting said stack are bodily separated from the sheet to be separated and after separation of the latter to return the stack into edgewise abutting contact with said traction surfaces.

4,348,020

BELT CONVEYOR FOR SIGNATURES

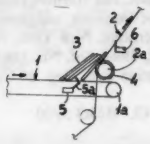
Giorgio Pessina, and Aldo Perobelli, both of Via Arborina 2, Paderno Dugnano, Italy

Filed May 5, 1980, Ser. No. 146,203

Claims priority, application Italy, May 18, 1979, 22807 A/79

Int. Cl.³ B65H *3/04*

U.S. Cl. 271—35 **7 Claims**



1. An improved belt conveyor for signatures, loose sheets, gathered sheets, and the like, having a device for picking up said signatures, etc., and being of the type including a set of feeder belts lying in a substantially horizontal plane and an associated set of elevator belts that receive signatures, etc., delivered to them by the feeder belts, said elevator belts lying in a substantially oblique plane which intersects the horizontal plane of the feeder belts, said feeder belts transporting signatures, etc., toward the intersection between said feeder and elevator belts, and said planes defining a first obtuse solid angular space, characterized in that:

(A) said set of elevator belts having at the output ends thereof near the set of feeder belts a deflecting roller the axis of rotation of which is parallel to the apex of the solid angle between said sets of belts, said deflecting roller being located in the path of travel of signatures, etc., leaving the feeder belts, and directing the elevator belts to pass through said feeder belts in a steeper plane than the oblique plane of said elevator belts leaving the deflecting roller, whereby there is provided at the intersection between said sets of belts a second angular space which is larger than the first angular space,

(B) said deflecting roller being provided with signature, etc., entrainment rings in the path of travel of signatures, etc., leaving the feeder belts,

(C) said rings having outer surfaces with a high frictional coefficient, which rings at least in part protrude beyond the elevator belts, whereby to contact and lift the foremost signature, etc., entering the second angular space as soon as the preceding signature, etc., has cleared said angular space.

4,348,021

SHEET FEEDING APPARATUS

David M. Montes, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1980, Ser. No. 209,579

Int. Cl.³ B65H *3/06, 3/08*

U.S. Cl. 271—112 **4 Claims**

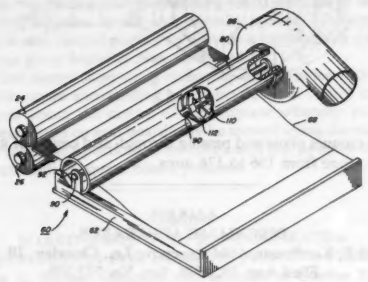
1. Sheet feeding apparatus comprising:

a cylindrical tube mounted in relation to a sheet supply, said

tube defining one or more openings positioned along its length opposite said supply;

means for creating a pressure reduction inside said tube to attract individual sheets to said tube openings; and

drive means for moving sheets away from the supply having a shaft centrally mounted in said tube which supports at



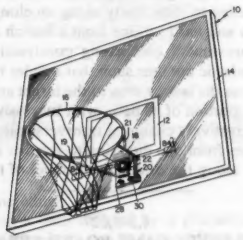
least one radially extending blade so that said blade extends through said one or more openings during each revolution of said shaft to contact each attracted sheet, and a number of turbine blades mounted to said shaft which respond to said means for creating a pressure reduction by rotating said shaft.

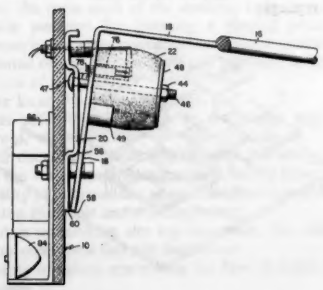
4,348,022

MOUNTING ASSEMBLY OF CONTROLLED RESILIENCE FOR BASKETBALL GOAL HOOP

John F. O'Donnell, Peoria, Ill., assignor to Safelex Systems, Peoria, Ill.

Filed Aug. 15, 1980, Ser. No. 176,721
Int. Cl.³ A63B *63/08*
U.S. Cl. 273—1.5 R **9 Claims**





4. A mounting assembly for a horizontal basketball goal hoop having a standardized L-shaped mounting bracket integral therewith for providing a connection of controlled resilience between such hoop and a vertical backboard therefor having standardized mounting apertures therein, comprising:

intermediate bracket means mounted in front of such backboard and having a plurality of mounting apertures therein positioned in alignment with respective ones of such standardized mounting apertures in such backboard, said intermediate bracket means having a portion thereof forming a horizontal fulcrum for such L-shaped bracket spaced away from the front of such backboard,

a resilient mass having a central aperture therethrough,

a threaded connector extending, in order, through an auxiliary mounting aperture in said intermediate bracket means, an auxiliary mounting aperture provided in the vertical leg of such standard L bracket integral with the goal hoop and through said central aperture in said resilient mass, with a nut on said threaded connector means for clamping together said series of elements with a predetermined force, and

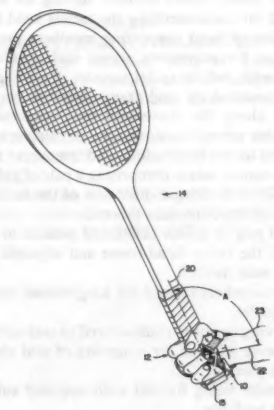
a threaded connector for each of said standardized mounting apertures in such backboard fixedly securing said intermediate bracket thereto and having a non-threaded portion extending through the corresponding aperture in the vertical leg of said hoop L bracket to act as a guide for movement of the latter relative to said intermediate bracket.

4,348,023

RACKET SPORTS TRAINING AID

Robin A. Hinson, 11602 Ashbury, Cleveland, Ohio 44106

Filed Dec. 4, 1980, Ser. No. 213,000
Int. Cl.³ A63B *69/38*
U.S. Cl. 273—29 A **9 Claims**



1. A racket sports training aid for improving the grip adapted to engage a player's wrist, hand, fingers and racket comprised of a wrist pad, a finger pad, a grip pad and strap; said strap interconnecting said wrist pad, said finger pad and said grip pad such that; said finger pad engages said fingers, said strap connects to said finger pad and passes away from said finger pad in two strap segments, a first strap segment passing from said fingers toward said wrist and a second strap segment passing from said fingers toward said wrist; said first strap segment and said second strap segment connect to said grip pad; said first strap segment adapted to pass near the heel of the hand and around said wrist and engage said wrist pad; said second strap segment adapted to pass near the base of the thumb of said hand and about said wrist engaging said first strap segment and said wrist pad; the engagement of said first strap segment and said second strap segment being adjustable such that said two strap segments may be varied in length and

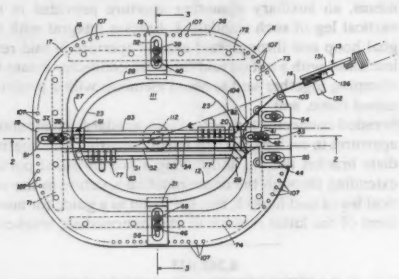
said grip pad is adapted to press against said racket when said two strap segments are shortened aiding in the proper grip of said racket.

4,348,024

RACKET STRINGING APPARATUS AND METHOD

John A. Balaban, 4142 Graham St., Pleasanton, Calif. 94566

Continuation-in-part of Ser. No. 11,145, Feb. 12, 1979, Pat. No. 4,249,732, and Ser. No. 99,215, Dec. 3, 1979, Pat. No. 4,326,713.
This application Jan. 25, 1980, Ser. No. 115,258
Int. Cl.³ A63B *51/14*
U.S. Cl. 273—73 A **16 Claims**



1. In a racket stringing apparatus having an open racket head frame holding fixture and means for tensioning a string drawn across the open area of said head frame, said fixture comprising;

an open center frame member having an annulus dimensioned for circumscribing the racket head frame;

a plurality of head supporting members mounted on said member for movement across said annulus for engagement with and for radial support of said head frame;

means mounted on said frame member for supporting a string clamp for movement to a succession of parallel positions across the open area of said racket head frame parallel to the longitudinal and transverse axes thereof;

said last-named means comprising a pair of guides positioned parallel to the longitudinal axis of the racket head frame adjacent opposite sides thereof;

a second pair of guides positioned parallel to the transverse axis of the racket head frame and adjacent said yoke and distal ends thereof;

carriage members formed for longitudinal reciprocation on said guides;

a rod having opposite ends secured to said carriage members and being adapted for mounting of said clamp along the length thereof;

said annulus being formed with opposed substantially flat planar surfaces;

said supporting members being mounted on one surface; and

said guides comprising rails mounted on the other of said surfaces.

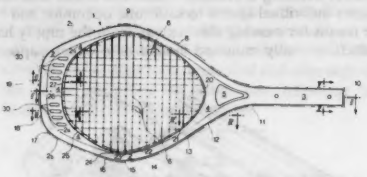
4,348,025

RACQUET

Neville D. Wills, Brighton, and Sigmund Kwiatkowski, Seacombe Heights, both of Australia, assignors to Half Court Tennis Pty. Limited, South Australia, Australia

Filed Jan. 21, 1981, Ser. No. 227,033
Claims priority, application Australia, Jan. 24, 1980, PE2134; Dec. 24, 1980, PE7070
Int. Cl.³ A63B *49/00*
U.S. Cl. 273—73 R **9 Claims**

1. A racquet having a strung weight in the range of 340 to 400 grams, a length between 480 and 500 mms, a centre of gravity located on the longitudinal axis of the racquet in the range of from 240 to 260 mms from the extremity of the racquet head and a radius of gyration about an axis perpendicular



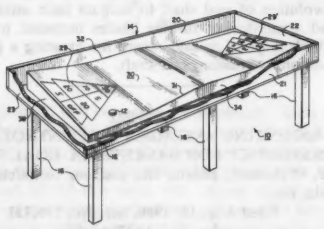
to the racquet plane and passing through said centre of gravity in the range from 156 to 176 mms.

4,348,026

DISC GAME APPARATUS

Russell E. Kauffmann, 1604 Executive Ln., Glenview, Ill. 60025

Filed Aug. 24, 1976, Ser. No. 717,339
Int. Cl.³ A63B *67/14*
U.S. Cl. 273—126 R **6 Claims**



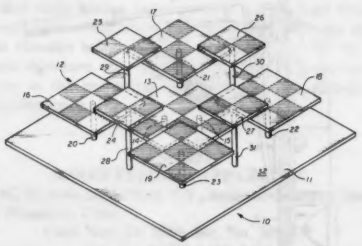
1. In a table-height game apparatus of the type wherein a slider is propelled to slide freely along an elongated, upward-facing smooth and hard surface from a launch area to a target area, the improvement comprising constructing the surface into a fixed inelastic contour such that a slider travelling along the surface from the launch area to the target area is presented, over at least a portion of its path, with successive surface areas having a progressively changing transverse pitch, which pitch smoothly varies from one direction to another and back to the first direction along the direction of travel of the slider.

4,348,027

MULTI-LEVEL GAME BOARD APPARATUS

Ricardo Escamilla-Kelly, 14123 Rosetta, Cypress, Tex. 77429

Filed May 26, 1981, Ser. No. 266,844
Int. Cl.³ A63F *3/02*
U.S. Cl. 273—241 **9 Claims**



1. A multi-level game board apparatus for use with a plurality of chess-like playing pieces, comprising

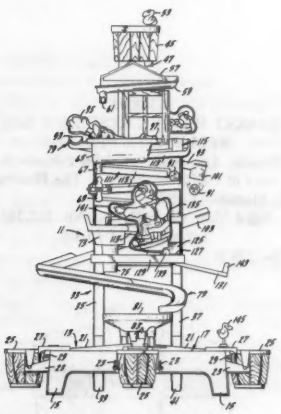
a square game board of bilaterally colored light and dark squares,
said board comprising a central portion and a plurality of surrounding separate portions, each of said surrounding portion being square in shape and cooperating to complete the square shape of said board,
means supporting said board central portion at one level,
means supporting said surrounding board portions at one or more different levels and laterally spaced to cooperate with said central portion to provide a substantially continuous game board in plan view, and
said last named supporting means supporting at least some of said square surrounding board portions for rotary movement about the center of such square whereby playing pieces used on said board may be moved along the surface of said board portions or by rotation of one or more of said surrounding square board portions.

4,348,028

BOARD GAME WITH RANDOM WATER DISTRIBUTION FOR DUNKING PLAYING PIECES

Gordon A. Barlow, Glenview, Ill., assignor to Gordon Barlow Design, Skokie, Ill.

Filed Feb. 10, 1981, Ser. No. 233,160
Int. Cl.³ A63F *3/00*; A63H *33/00*
U.S. Cl. 273—249 **8 Claims**



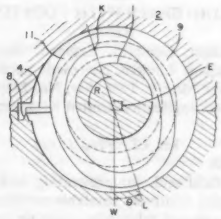
1. A game including:
a base having a path defined by a plurality of spaces on which playing pieces can be moved from a starting point to a finish point as a result of the selection of a random number of spaces for each move of each playing piece, a plurality of dunking stations for the playing pieces located along the path, each of the dunking stations including a tiltable platform for dumping a playing piece located thereon into a water container, each water container being mounted on the base, each tiltable platform functioning as a space of the path,
a tower located adjacent the base,
a water reservoir supported on the tower near the top thereof,
a water distributor positioned between the water reservoir and the water containers mounted on the base,
a plurality of intermediate water containers located between the top reservoir and the distributor,
a conduit connecting the top reservoir, the intermediate water containers and the distributor,
a plurality of valves controlling the flow of water along the conduit,
a first of the valves controlling the flow of water from the top reservoir to the conduit,
a first downwardly inclined marble track supported on the tower and arranged to discharge a marble into the water distributor,
a first releasable detaining means for holding a first marble near the top of the first track and for selectively releasing the first marble to allow it to roll down the first track,
a second downwardly inclined marble track also supported on the tower,
a second releasable detaining means for holding a second marble near the top of the second track and for selectively releasing the second marble to allow it to roll down the second track,
the first releasable detaining means for holding the first marble being releasably actuated by water filling one of the intermediate water containers,
the second releasable detaining means for holding the second marble being releasably actuated by the first marble rolling down the first track,
a second of the valves controlling the flow of water through the conduit controls the flow of water out of another of the intermediate containers, and
means are provided for opening the second valve by the second marble rolling down the second track,
the distributor being equipped with a plurality of water discharge outlets each of which is closable by the first marble seating in the outlet,
a plurality of flues located beneath the distributor with each flue aligned with a distributor discharge outlet and a water container on the base.

4,348,029

SEAL-RING TYPE SHAFT-SEALING DEVICE

Norio Oishi; Toshinari Shimazu, both of Kobe; Takuya Suganami, and Takahiro Masuda, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00011, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/02051, PCT Pub. Date Jul. 23, 1981
PCT Filed Jan. 16, 1981, Ser. No. 285,097
Claims priority, application Japan, Jan. 17, 1980, 55-4213
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—26 **1 Claim**



1. In a seal-ring type shaft-sealing device comprising an annular seal ring held in housing and fitted loosely around a rotating shaft passing through the side walls of said housing in which said seal ring is rendered in a floating state upon said rotating shaft by sealing liquid forced into said housing, an improvement characterized in that the inner circumference of said annular seal ring is substantially oval and is held in an inclined state so that the angle formed by the longitudinal axis of the ellipse and the gravity force direction of said seal ring in the revolutional direction of said rotating shaft is smaller than 90°.

4,348,030

TOGGLE-ACTION FACE SEAL FOR RELATIVELY ROTATABLE MEMBERS

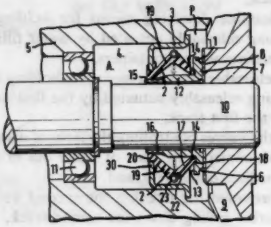
David E. Johnston, Gosforth, England, assignor to George Angus & Company Limited, Newcastle upon Tyne, England

Filed May 6, 1981, Ser. No. 260,937

Claims priority, application United Kingdom, May 12, 1980, 8015639

Int. Cl.³ F16J 15/36

U.S. Cl. 277—40 6 Claims



1. A face seal comprising a rigid sealing ring carried by a free end of a coaxial resiliently deformable sleeve, the other end of the sleeve having means for mounting the sleeve fluid-tight on one member so as in use to present the sealing ring to bear axially against a counterface on another, relatively rotatable, member, the unconstrained shape of the sleeve being substantially that of two axially opposed frusto-conical parts of which the smaller diameters are at the ends of the sleeve respectively and the larger diameter portions form a flexible circumferential junction at about the mid-length of the sleeve, there being provided around the circumferential flexible junction of the sleeve a circumferential groove which defines a pivotal toggle joint for the frusto-conical parts of the sleeve, a contractile spring seated in said groove and the free end of the sleeve being supported on the sealing ring by means shaped to conserve in use the frusto-conical shape of the adjacent sleeve part, the sleeve thereby forming a toggle system which, in use, is exposed to the pressure of fluid to be sealed and exerts on the sealing ring an axial bearing load dependent on the axial lengths and angles of conicity of the frusto-conical parts of the sleeve and on the ratio of the diameters of the ends of the sleeve.

4,348,031

ROTARY FLUID SEALS WITH FLOATING SEALING RINGS

David E. Johnston, Gosforth, England, assignor to George Angus & Company Limited, Newcastle upon Tyne, England

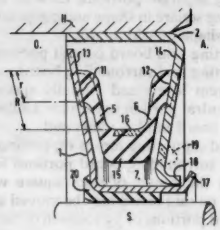
Filed Mar. 9, 1981, Ser. No. 241,647

Claims priority, application United Kingdom, Mar. 18, 1980, 8009057

Int. Cl.³ F16J 15/34

U.S. Cl. 277—83 7 Claims

1. A rotary fluid seal, for preventing leakage of fluid between two coaxial relatively rotatable members, comprising a pair of axially opposed relatively rotatable counterface members, a circular flexible sealing ring freely located to float substantially coaxially between the conterface members, the sealing ring having a pair of radially outwardly divergent, oppositely axially directed, annular sealing lips to bear resiliently against the counterfaces respectively of the counterface members, so that the sealing ring is frictionally driven into rotation by one or the other of the counterface members on relative rotation thereof, the sealing lips each presenting to the respective counterface a frusto-conical contact face defined by radially inner and outer peripheral edges and the counterfaces being radially outwardly divergent and frusto-conical over an area provided for face contact by the sealing lip contact faces, the sealing ring being substantially coaxially located by seating between the counterfaces, and the effect of centrifugal force, due to rotation of the sealing ring, being to cause the sealing



lips to tend to flex angularly outwardly towards a radial plane and thereby to reduce the bearing load of the contact faces on the counterfaces.

4,348,032

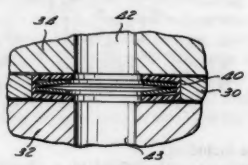
HEAD GASKET HAVING RESILIENT SEAL WITH BELLEVILLE SPRINGS

Larry K. Hanson, Los Alamitos, and Silvano A. Bosdachin, Downey, both of Calif., assignors to The Fluorocarbon Company, Los Alamitos, Calif.

Filed Mar. 19, 1981, Ser. No. 245,395

Int. Cl.³ F16J 15/06

U.S. Cl. 277—235 B 12 Claims



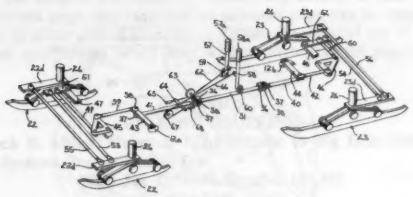
1. A seal for use between two stationary members such as an engine cylinder head and block, such seal comprising a resilient jacket having a closed loop shape and a generally U-shaped cross-section with a closed end and a pair of legs forming a closed loop recess, a pair of spring elements having a closed loop configuration positioned within the recess in the jacket in face-to-face opposing relation, first portions of the elements extending towards each other and engaging the closed end of the jacket U-shaped cross-section, second portions of the elements being spaced from each other and located adjacent to the open end of the jacket and reacting against the inner surfaces of the jacket, said elements being imperforate on their first and second portions and being resiliently compressible towards each other when the seal is compressed between the members, the elements biasing the legs to spread, and the outer faces of the jacket legs forming sealing surfaces against such members, the jacket outer periphery being sized to fit snugly within walls of a surrounding hole or recess so that the outer edges of the elements are maintained in aligned relation when the elements are compressed.

4,348,033

BOBSLED

David B. Stevens, 36324 S. Beach Rd., Oconomowoc Lake, Wis. 53066

Filed Aug. 18, 1980, Ser. No. 179,012
Claims priority, application United Kingdom, Aug. 29, 1979, 7929979
Int. Cl.³ B62B *13/08*
U.S. Cl. 280—16 8 Claims



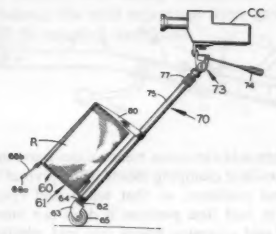
1. A bobsled which comprises:
a frame formed along a longitudinal axis;
a front axle and a rear axle carried by the frame transverse to its longitudinal axis;
two laterally spaced front runner assemblies pivotally connected to the front axle on opposite sides of the longitudinal axis of the frame;
two laterally spaced rear runner assemblies pivotally connected to the rear axle on opposite sides of the longitudinal axis of the frame;
a front link pivotally connected at its opposite ends to opposite front runner assemblies;
a front steering motion translator pivotally mounted on one side of the longitudinal axis of the frame, the steering motion translator having a first radial portion extending forward of its pivot and having a second radial portion extending laterally from its pivot towards the longitudinal axis;
means connecting the forwardly extending radial portion of the front steering motion translator to one of the front runner assemblies;
a rear link pivotally connected at its opposite ends to opposite rear runner assemblies;
a rear steering motion translator pivotally mounted on the opposite side of the longitudinal axis of the frame from the pivot of the front steering motion translator, the rear steering motion translator having a first radial portion extending rearwardly from its pivot and having a second radial portion extending laterally from its pivot towards the longitudinal axis;
means for connecting the rearwardly extending radial portion of the rear steering motion translator to one of the rear runner assemblies;
a steering linkage carried longitudinally by the frame and connecting the laterally extending radial portion of the front steering motion translator to the laterally extending radial portion of the rear steering motion translator; and
manually operable steering control means coupled to the steering linkage for axial movement of the linkage to pivot the front and rear steering motion translators in opposite rotational directions, so that the rear runner assemblies are pivoted counter to the front runner assemblies in a turning maneuver.

4,348,034

COLLAPSIBLE CARTS AND SUPPORTS FOR CAMERAS AND THEIR EQUIPMENT

David I. Welt, Miami, Fla., assignor to Welt/Safe-Lock, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 26,788, Apr. 3, 1979, abandoned. This application Sep. 23, 1980, Ser. No. 189,582
Int. Cl.³ B62B *1/12*
U.S. Cl. 280—35 6 Claims



1. A cart and camera support unit comprising a two-wheeled cart, a camera support having a sectionalized tubular telescoping leg which carries at an upper end thereof a pan head with a laterally projecting handle for manipulating and locking the head in selective adjusted positions including a rearwardly and upwardly extending position to serve as a manipulative handle for the cart and camera support unit, and separable connecting means coacting between the lower end of the leg and the two-wheeled cart, said cart comprising a transverse bar supported at each opposite end by one of said wheels mounted in a caster fork attached beneath said bar, means securing each of said caster forks against relative rotation with respect to said transverse bar, a component of said connecting means being located on said transverse bar midway between said wheels and formed as an upstanding threaded male member, a collapsible platform for equipment formed by a pair of bars, each having one end pivotally mounted on the transverse bar spaced symmetrically on opposite sides of said connecting means component and adapted when in operative position to extend in parallel relation in a forward direction and in perpendicular relation to said transverse bar and to pivot toward each other in an overlapping relation and against said transverse bar in collapsed position, an opposite free end of each of said platform bars being downturned to form a ground engaging foot coacting with said wheels as a four point support disposing said platform horizontally in rest position, a pair of symmetrically spaced upstanding stops secured to said transverse bar for engaging said equipment when said platform is tilted rearwardly by manipulation of said handle in said rearwardly and upwardly extending position for rolling the unit on said wheels, and a female member of said connecting means formed as an internally threaded self-locking connector press fitted into the bore of said tubular leg at the bottom end thereof and located to separably engage said male member.

4,348,035

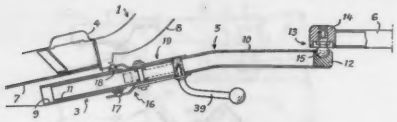
TOWING ATTACHMENTS FOR ATTACHING TRAILERS TO VEHICLES

Francois Wasservogel, Treffort - 01370 Saint Etienne du Bois, France

Filed Feb. 22, 1980, Ser. No. 243,967
Int. Cl.³ B60D *7/00, 1/08*
U.S. Cl. 280—478 R 11 Claims

1. A towing attachment for attaching a trailer including a tow bar to the end of a vehicle comprising a tubular member attached to said vehicle, extension means including a first end and second end, said first end of said extension means being rotatably attached to said tow bar of said trailer and said second end of said extension means being adapted for releasable

attachment to said tubular member, said second end of said extension means having a cross-sectional shape which is complementary to the cross-sectional shape of said tubular member whereby it can slide smoothly into said tubular member for attachment thereto, and clamping means for releasably clamping said second end of said extension means to said tubular member, said clamping means including fixed trunnion means extending from said tubular member and resilient clamping means affixed to said extension means, whereby said resilient clamping means may be releasably clamped to said trunnion



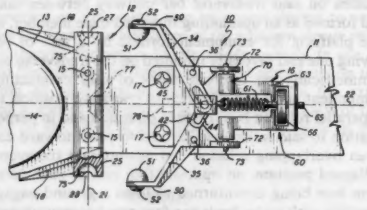
means when said extension means slides into said tubular member, said resilient clamping means being pivotable between first and second positions, so that when said resilient clamping means is in said first position it does not interfere with the sliding of said extension means into said tubular member, and when said resilient clamping means is in said second position, it prevents said extension means from being slidably released from said tubular member, and whereby said tubular member may be located inwardly with respect to said end of said vehicle.

4,348,036

SAFETY BINDING FOR NORDIC SKIS

Richard J. Settembre, 714 Velasko Rd., Syracuse, N.Y. 13207

Filed Aug. 19, 1980, Ser. No. 179,503
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—615 **11 Claims**



1. A safety binding for use in conjunction with a cross country ski including

a toe piece that is adapted to be secured to the front of a ski boot, said toe piece further having a pair of opposed open faced sockets that are oval in form and which lie along a common centerline that will be normal to the central axis of the boot,

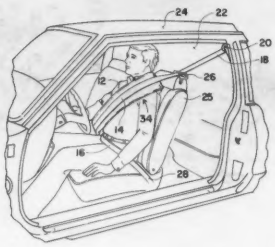
a ski piece that is adapted to be secured to the top surface of a ski that further includes a pair of coacting scissor arms pivotably mounted therein so that the distal ends of the arms move between an open and a closed position in a plane that is generally parallel with the top surface of the ski, a biasing means acting upon the scissor arms for urging the distal ends of the arms towards said closed position, and an oval shaped ball member affixed to the distal end of each arm, said ball members being arranged to move with the arms towards each other when the arms are moved toward said closed position, said ball members having a shape that compliments the inner surface of the sockets and being capable of being received therein as the arms are moved towards said closed position thereby securing the toe piece of the binding to the ski piece, both the oval shaped ball and socket having a major axis that is generally perpendicular to the top surface of the ski when the two are brought together in assembly.

4,348,037

SAFETY CUSHION ATTACHABLE TO BELT-TYPE RESTRAINTS

Bliss W. Law; George F. Kirchoff, and Gary V. Adams, all of Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Jun. 3, 1980, Ser. No. 152,922
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—733 **8 Claims**



1. Safety cushion apparatus attachable to belt-type restraints for protecting vehicle occupants including,

an elongated inflatable cushion folded and compacted to conform to the shape of a belt-type restraint to which it is to be attached, and

releasable means to fasten said folded and compacted inflatable cushion to the belt-type restraint in conforming relationship therewith and for support thereby,

wherein the material of which the inflatable cushion is made is selected to allow leakage of gas from the interior thereof thereby to impede hardening of the exterior surface of said inflatable cushion upon inflation thereof, and

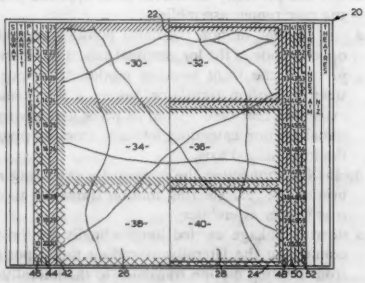
wherein said inflatable cushion is made of neoprene coated rib stock nylon sheet and includes seams that are sealed with silicone rubber, said seams providing said leakage.

4,348,038

MAP

Peter Lynch, 134 Carlton Ave., Toronto, Canada (M5B 2G2)

Filed May 27, 1980, Ser. No. 153,384
Int. Cl.³ G09B *29/04*; B42D *1/04*
U.S. Cl. 283—34 **3 Claims**



1. A map illustrating a subject pictorially in sections, the map comprising a plurality of pages and means coupling the pages to one another at a spine so that with the map open at its centre pages, there are centre pages at both sides of the spine showing the subject to a small scale broken into said sections, each of

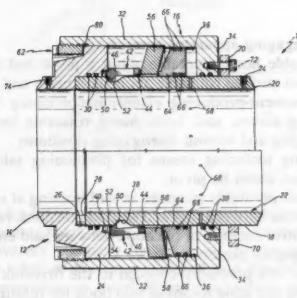
the sections carrying identifying coding and each of the pages below these centre pages being larger than the centre pages and smaller than the page below it so that when viewed in said open condition with the smallest of the pages uppermost, at least one of each of the edges of the pages parallel to the spine and below the smallest pages is visible and displays identifying coding corresponding to that used for one of the sections appearing on the centre pages, at least some of the pages below the centre pages consisting of at least two folded panels proportioned so that adjacent pages can be opened and after arranging in face-to-face relationship, the pages can be refolded to close the map while maintaining this face-to-face relationship, whereby in use a section can be selected from the display of the subject and using the identifying coding to find the relevant page, this page and an adjacent page can be opened out to either side of the spine to display the selected one of the said sections to a larger scale without damaging the pages.

4,348,039

RELEASE COUPLING

Jack E. Miller, Houston, Tex., assignor to Big Inch Marine Systems, Inc., Houston, Tex.

Filed Jul. 17, 1980, Ser. No. 169,841
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—1 **30 Claims**



1. A high pressure coupling for releasably coupling high pressure tubular elements in sealed relationship, the coupling comprising:

a first tubular member having a socket formation;

a second tubular member having a spigot formation to be sealingly engaged with the socket formation in mating relationship therewith;

one member having an annular recess and the other member having a radially directed annular bearing surface to cooperate with a locking sleeve, the annular recess being shaped to define an annular abutment surface;

a radially deformable locking sleeve having a complementary annular abutment surface, the locking sleeve being adapted to be located with its complementary annular abutment surface in abutment with the annular abutment surface in the annular recess, and the locking sleeve being adapted to be located against radial deformation out of the recess by the bearing surface engaging with a radially directed surface of the locking sleeve during use;

bias means to be operative between the tubular members to bias the complementary abutment surface into engagement with the abutment surface to provide a predetermined bias force to restrain axial separation of the formations when mated;

the tubular members when mated being axially separable upon application of an axial separation force in excess of the predetermined bias force of the bias means for the bearing surface to disengage from the locking sleeve, and for the bias means to continue to bias the complementary abutment surface against the abutment surface to force the locking sleeve to become radially deformed out of the annular recess to release the member having the recess for the spigot formation to separate from the socket formation; and

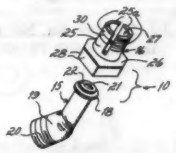
the tubular members being shaped to define, when mated, an annular pressure balancing chamber which is in communication with the coupling bore and which is further defined by axially spaced radially extending pressure flanges which are associated with the members for pressure within the balancing chamber to act on the flanges for urging the members into mating engagement and at least partially balance the axial separation force generated by pressure in the coupling during use.

4,348,040

FLANGED PIPE FITTING

Martin J. Harjar, Vermilion, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Dec. 11, 1980, Ser. No. 215,262
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—175 **19 Claims**



1. A two-piece pipe fitting adapted to be secured to a connector body, said fitting comprising

a tube element having a radial flange adjacent one end of the element, and a section of substantially larger external dimension than the external diameter of said radial flange formed on the end of said tube opposite from said one end, and

a unitary threaded sleeve nut surrounding said tube element, said threaded sleeve nut having a generally tubular body section formed on one end and a circumferentially continuous nut section formed on the other end, said tubular body section being longitudinally split and having male threads formed thereon,

said one end of said threaded sleeve nut having an internal diameter less than the diameter of said radial flange of said tube element and said other end of said threaded sleeve nut having an internal diameter larger than the external diameter of said radial flange of said tube element, said threaded sleeve nut being positioned over said tube element by forcing the split tubular body section over said radial flange of said tube element while radially expanding the split tubular body section of said sleeve nut, and said threaded sleeve nut being retained on said tube element by engagement of an end surface of said split tubular body section of said sleeve nut with said radial flange of said tubular element.

4,348,041

BUTT WELDED TUBULAR STRUCTURE OF AUSTENITE STAINLESS STEEL

Katsuyuki Imai; Isao Masaoka; Yochiteru Chiba, all of Hitachi; Masayoshi Kanno, Kitaibaraki, all of Japan; Jiro Kuniya, San Jose, Calif., and Hisao Itow, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1979, Ser. No. 6,216
Claims priority, application Japan, Jan. 25, 1978, 53/6254
Int. Cl.³ F16L *13/04*
U.S. Cl. 285—286 15 Claims

1. A butt welded tubular structure for use with nuclear reactors, comprising:

two tubular members of austenite stainless steel butt welded together at their adjacent ends to form a welded joint and weld heat affected zones immediately adjacent said welded joint; and

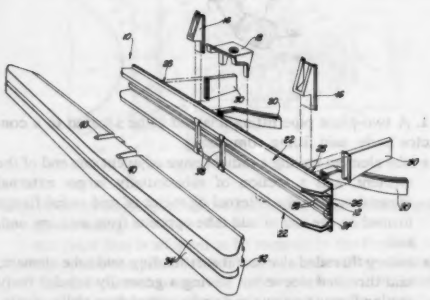
an imperforate restraining member providing a cover to said welded joint and adjacent heat affected zones of said tubular members in a manner to substantially form a clearance between the restraining member and the tubular members, said restraining member being formed of a metal of lower stress corrosion cracking sensitivity than the material of said tubular members, said restraining member being welded at the entire surfaces of opposite end portions thereof to said tubular members, said restraining member being spaced from said welded joint and said heat affected zones to form an annular chamber between said restraining member and said welded joint and the heat affected zones of the tubular members.

4,348,042

VEHICLE BUMPER ASSEMBLY

Jerry V. Scrivo, Dover, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 14, 1980, Ser. No. 168,477
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—120 24 Claims



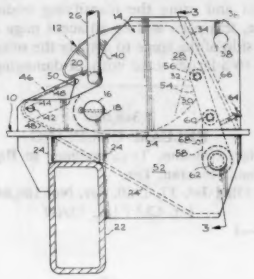
1. A vehicle bumper assembly (10) comprising; elongated mounting means (12) adapted for being an integral part of the vehicle structure, energy absorber means (14) for absorbing impact energy, said energy absorber means (14) being connected to said mounting means (12) for support thereby, and characterized by said mounting means (12) including two vertically spaced and interconnected hollow tubular portions (22), each of said tubular portions (22) having a closed cross section and extending along the length of said mounting means (12) for providing structural rigidity and minimal deflection under impact loads, said mounting means (12) including a back portion (24, 26) extending between and interconnecting said tubular portions (22), said energy absorber means (14) engaging said back portion (24, 26) and extending vertically between and engaging said tubular portions (22), said energy absorber means (14) extending away from said back portion (28, 26) forwardly beyond said tubular portions (22).

4,348,043

DISENGAGING APPARATUS

Joseph N. Fandel, San Diego, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Jun. 16, 1980, Ser. No. 159,826
Int. Cl.³ B66C *1/34*
U.S. Cl. 294—83 R 18 Claims



1. Disengaging apparatus comprising:

a releasable hook pivotable about a pivot and including a contact surface rotatable about said pivot and an off-center moment-producing extension containing linkage engaging means, said hook being rotatable between first engaging and second disengaging positions;

a housing including means for positioning said hook for rotation about its pivot;

a first link pivotably mounted in said housing at one end and pivotable between first and second positions, respectively, to control rotation of the hook between said engaging and disengaging positions;

a second link pivotably coupled to the first link and to the linkage engaging means of said hook for rotating the hook about its pivot axis; and

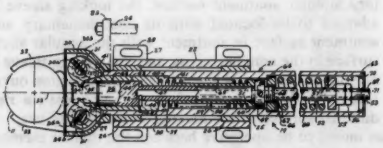
stop means for stopping movement of the first and second links short of straight line orientation when the hook is in the engaged position.

4,348,044

ARTICLE GRIPPING APPARATUS

David B. Wood, III, West Chester, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 10, 1980, Ser. No. 195,756
Int. Cl.³ B66L *1/42*
U.S. Cl. 294—88 8 Claims



1. An article gripping apparatus, comprising in combination:

(a) a housing;

(b) at least one clamp finger movable on said housing from an unclamped position to a clamped position and the reverse;

(c) means for opposing said clamp finger and gripping an article therebetween;

(d) an actuator supported in said housing for moving said clamp finger to said clamped position and the reverse;

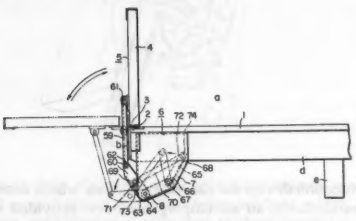
(e) first biasing means for biasing said actuator relative to said housing in a first predetermined direction;
(f) an interference block engageable with said finger when said actuator is biased in said direction;
(g) second biasing means for biasing said interference block relative to said actuator in a second, predetermined finger-engaging direction; and
(h) means for overcoming said second and first biasing means.

4,348,045

DEVICE FOR OPENING AND CLOSING A SIDE PLATE OF A LOADING BOX ON A MOTOR TRUCK UNDER NO-LOAD CONDITION

Masaki Hori, Funabashi, and Hisashi Hori, Yokohama, both of Japan, assignors to Jidosha Seiko Co., Ltd., Tokyo, Japan

Division of Ser. No. 829,455, Aug. 31, 1977, Pat. No. 4,165,121, which is a division of Ser. No. 672,308, Mar. 31, 1976, abandoned. This application May 23, 1979, Ser. No. 41,786
The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.
Int. Cl.³ B60P *3/04*
U.S. Cl. 296—14 **3 Claims**



1. A device for opening and closing a side plate of a loading box on a motor truck under no-load condition, the side plate being outwardly openably hinged at its bottom edge to the outer side edge of the floor plate of said loading box, said device comprising an interlocking mechanism consisting of two upper and lower actuating connecting rods and twice-foldably articulated to a point on the outer surface of said side plate and to the lower portion of a support arm downwardly depending from the underside of said floor plate, said interlocking mechanism being resiliently pulled by a pull spring downwardly and sidewise of said floor plate to hold said side plate in equilibration, said upper actuating connecting rod having the upper end thereof articulated to said point on the outer surface of said side plate and having the lower end thereof articulated to the upper end of said lower actuating connecting rod, the lower end of said lower actuating connecting rod being articulated to the lower portion of said support arm, a flicking arm rod having the lower end thereof articulated to the upper portion of said support arm by means of a resilient torsion shaft, and a control connecting rod having the opposite ends thereof articulated to the upper portion of said flicking arm rod and an intermediate portion of said lower actuating connecting rod, respectively.

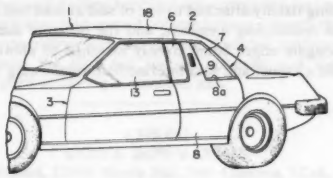
4,348,046

REAR SIDE DOOR STRUCTURE FOR A FOUR-DOOR TYPE AUTOMOBILE

Takeji Ohya, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 14, 1980, Ser. No. 168,703
Claims priority, application Japan, Jul. 16, 1979, 54/90853; Aug. 31, 1979, 54/120840[U]; Aug. 31, 1979, 54/120841[U]
Int. Cl.³ B60J *1/00*
U.S. Cl. 296—201 **10 Claims**

1. A rear side door structure for an automobile which is adapted to be used with a front side door of a sashless type, and which comprises a rear door panel assembly having an upper hem for defining a lower edge of a window opening, guide means extending upwardly from the upper hem of the door panel assembly for dividing the window opening into a front opening portion and a rear opening portion, a transparent front glass panel disposed in said front opening portion, a transparent



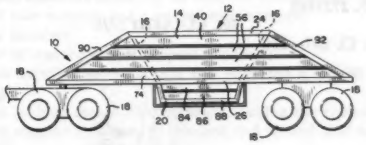
rear glass panel disposed in said rear opening portion, said rear glass panel being movable along the guide means so that it can be retracted into the door panel assembly, said door panel assembly being provided with cover means which is located to cover said guide means, said front glass panel being fixed to the door panel assembly.

4,348,047

WALL CONSTRUCTION FOR A BELLY DUMP TRAILER

George A. Harshman, 1253 Neil Creek Rd., Ashland, Oreg. 97520

Filed Sep. 15, 1980, Ser. No. 187,480
Int. Cl.³ B62D *27/00*
U.S. Cl. 296—184 **12 Claims**



1. A wall for containing a bulk cargo in a vehicle, comprising:
(a) an inner wall member having inner and outer sides;
(b) an elongate three-sided first channel reinforcing member fixedly attached to said outer side of said inner wall member, said first channel reinforcing member having a pair of generally parallel sides extending generally perpendicularly from said inner wall member, and an interconnecting side oriented generally parallel with said inner wall member, said first channel reinforcing member and said inner wall member together defining a tube;
(c) an elongate three-sided second channel reinforcing member fixedly attached to said outer side of said inner wall member and spaced apart from said first channel reinforcing member, said second channel reinforcing member having a pair of generally parallel sides extending generally perpendicularly from said inner wall member and an interconnecting side spaced apart from and oriented, generally parallel with said inner wall member, said second channel reinforcing member and said inner wall member together defining a tube;
(d) located between said first and second channel reinforcing members, at least one elongate intermediate reinforcing member having a face portion spaced apart from and extending generally parallel with said inner wall member and a rib portion extending generally perpendicularly toward said inner wall member, said face portion having an elongate edge spaced apart from said outer side and fixedly attached to one of said generally parallel sides of one of said first and second channel reinforcing members

and said rib portion being fixedly attached to said outer side of said inner wall member; and

(e) an elongate closing reinforcing member, said closing reinforcing member having a face portion and a pair of opposite elongate edges, said face portion being spaced apart from and oriented generally parallel with said inner wall member, one of said pair of opposite elongate edges being fixedly attached to one of said at least one intermediate reinforcing members, and the other of said opposite elongate edges being fixedly attached to another one of said channel and said intermediate reinforcing members.

4,348,048

ADJUSTABLE CURVED SEAT FOR INFANTS

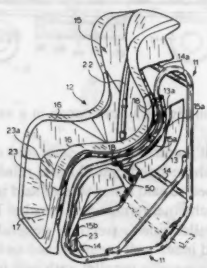
Gilles Thevenot, Baden-Baden, Fed. Rep. of Germany, assignor to Storchenmuhle Kinderausstattungs-GmbH & Co., Textile & Hartwarenwerk KG, Markleugast, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 916,662, Jun. 19, 1978. This application Jun. 10, 1980, Ser. No. 158,094

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727785

Int. Cl.³ A47D 1/10

U.S. Cl. 297—250 **7 Claims**



1. An adjustable boat-shaped seat for infants, particularly for use as a car seat, comprising:

a generally boat-shaped seat having armrests on each side thereof and a generally arcuately-shaped slide guide having a generally U-shaped channel, integrally-joined to the underside of said seat on each side thereof adjacent to each of said armrests thereof; and

a rigid frame supporting said seat, said frame including two generally arcuately-shaped rails disposed generally parallel to the sides of said seat, each of which slidably supports said seat and lies in front of, and above, one of said slide guides within said channel thereof to permit movement of said seat between sitting and prone end positions, said frame being made from tubular metal and including two congruent, generally parallel pipe frames, to each of which one of said rails is connected and at least two transverse connecting struts which rigidly connect said two pipe frames together; and

means for arresting said seat on said frame in at least said sitting and prone end positions.

4,348,049

PROTECTING DEVICE FOR CARRYING CHILDREN

Michel Monot, Les Bois des Grottes, Asnieres les Dijon, and Hubert Monot, Asnieres les Dijon, both of 21380 Messigny, France

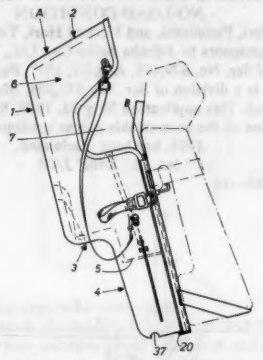
PCT No. PCT/EP79/00088, § 371 Date Jul. 3, 1980, § 102(e) Date Jul. 3, 1980, PCT Pub. No. WO80/00946, PCT Pub. Date May 15, 1980

PCT Filed Nov. 7, 1979, Ser. No. 205,954

Claims priority, application France, Nov. 8, 1978, 78 32063

Int. Cl.³ A47D 1/10

U.S. Cl. 297—254 **8 Claims**



1. Protection device for carrying children, which comprises, more particularly, an enveloping back-rest provided with a head-rest overlying a seat surrounded by upholstered sides, a foot-rest, this assembly being adapted to be secured by suitable means behind the seat of a vehicle, characterized by the fact that it consists of at least two elements independent of each other and provided with means for quickly coupling and uncoupling these elements, one element consisting of a rigid shell surrounding the child from head to feet, which comprises an open side of which the major portion of the outer periphery lies in a single plane substantially parallel to the solid bottom of the shell, said shell being a unitary member comprising several sections, a hood, a bottom, a seat, a cradle for receiving the legs, in which a suspended foot-rest is slidably mounted, the other element being a rigid frame provided with means for fixing it to the back-rest of a vehicle seat, means for quickly fastening the shell to the frame, means for holding said shell in a predetermined position in relation to the frame.

4,348,050

HINGING DEVICES FOR SEAT BACKS

Alain Letournoux, Saint-Jean-Le Blanc, and Christian Raye, Etrechy, both of France, assignors to Societe Industrielle Bertrand Faure, Etampes, France

Filed Jul. 23, 1980, Ser. No. 171,359

Claims priority, application France, Aug. 2, 1979, 79 19874

Int. Cl.³ A47C 1/026

U.S. Cl. 297—365 **11 Claims**

1. A seat back hinging device comprising:

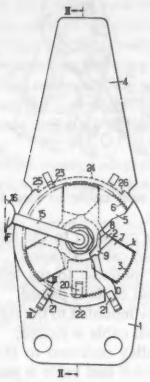
a control handle accessible to the person sitting in the seat;

a first inner toothed ring integral with a side-plate of the sitting portion of the seats

a second inner toothed ring integral with a side-plate of the seat back portion and coaxial with said first ring;

locking means actuable by the control handle to responsively cause said first and second rings to be either angularly locked or angularly free with respect to one another; said locking means comprising n toothed bolts each adapted to coact with the teeth of said first and second rings, said bolts being spaced apart evenly about the common axis of these

rings interiorly thereof, at respective mutual angular distances of the other of 360°/n, n being a whole number at least equal to 1, and a central rotary flat cam actuable by said control handle and adapted to coact with said bolts so as either to move them radially away from said common axis to put them in locking relationship with said first and second rings, or to cause them to move radially nearer said common axis thereby freeing them from said locking relationship; and means for resiliently urging the control handle and the cam towards their position corresponding to said locking relationship, the bolts and the cam being mounted so as to be



able to float slightly transversely with respect to said first and second side-plates while being wedged axially therebetween, said hinging devide further characterized in that the rotary flat cam includes a first cylindrical projection on one of its faces adapted to coact with a first complementary bore in one of said side-plates, said first projection and bore defining a first clearance therebetween and, on its other face, a second cylindrical bore adapted to coact with a second complementary projection on the other of said side-plates defining therebetween a second clearance so that said first and second coacting projections and bores assist in the relative centering of said side-plates.

4,348,051

SEAT WITH ADJUSTABLE FOOT-REST

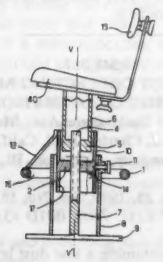
Guy Boucher, Paris, France, assignor to La Telemecanique Electrique, France

Continuation of Ser. No. 20,132, Mar. 13, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 206,406

Claims priority, application France, Mar. 14, 1978, 78 07319

Int. Cl.³ A47C *7/50*

U.S. Cl. 297—423 **4 Claims**



1. In a seat, adjustable in height and having a seat-member, a backrest and a foot-rest having a cylindrical hub and a ring shaped outer part concentrically mounted about said hub, the improvement which comprises: a first cylindrical column having a free upper end and a base resting on the ground and connected to the lower end of the first column, the said first column having a first threaded portion and a second threaded portion, the said hub having a third cylindrical threaded portion which cooperates with the first threaded portion of the first column; and a second column supporting the seat member and the back-rest, said second column having a fourth threaded portion cooperating with the second threaded portion of the first column, the first and second columns and the third threaded portion having a common axis.

4,348,052

KNOCK DOWN CHAIR

Billy F. Roland, 37805 Maple Hill, Mt. Clemens, Mich. 48043

Filed Feb. 29, 1980, Ser. No. 125,961

Int. Cl.³ A47C *4/03*

U.S. Cl. 297—440 **4 Claims**

1. A knock down chair made from an assembly of interlocking planar members requiring no fasteners comprising:

a first side member and a second side member;

a seat member;

a pair of transverse seat support members;

a back member having a first side edge and a second side edge;

a first locking means for rotatingly locking the transverse seat support members to the first and second side members;

a second locking means comprising a pair of opposed forwardly and rearwardly projecting hook means for securing the seat member to and preventing transverse movement of the rearward and forward portions of the first and second side members; and

a third locking means for securing the back member to the first and second side members.

4,348,053

FOAM PADDED CHAIR WITH SCREW ASSEMBLY OF SEAT, BACKREST AND LEGS

Alex Strassle, Kirchberg, Switzerland, assignor to Intercollection Development SA, Kirchberg, Switzerland

Filed Jun. 19, 1980, Ser. No. 160,806

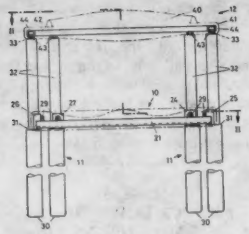
Claims priority, application Switzerland, Aug. 3, 1979, 7165/79

Int. Cl.³ A47C *5/06*

U.S. Cl. 297—445 **10 Claims**

1. A chair including rigid supporting elements and soft foam padding, comprising: a seat (10) including a rigid frame (20–23), a plurality of inserts (24–27) rigidly mounted on said frame for individually securing an equal plurality of columnar legs (11) thereto, said inserts each having a concave configuration which mates with and matches a corresponding covex surface of an associated leg and having a fastening element (29) secured thereto for rigidly mounting said associated leg, a rigid planar seat core (28) inserted into said frame, a first molded foam padding encasing the frame and the seat core on all sides with the exception of outwardly facing surfaces of said inserts, rear ones of the columnar legs extending above the seat, a backrest (12) comprising a rigid frame (44) having fastener

elements (43) rigidly secured thereto for fastening to abutting ends of the extended columnar legs, and a second molded foam



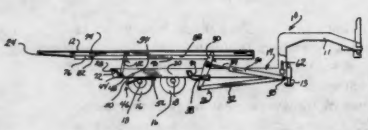
padding encasing the backrest frame on all sides with the exception of downwardly facing surfaces of the fastener elements.

4,348,054

CONVERTIBLE ADJUSTABLE BED VEHICLE

Gary L. Shonkwiler, 942 Beale St., South Bend, Ind. 46616, and Forest M. Shonkwiler, 22652 W. Madison Rd., South Bend, Ind. 46614

Filed Jul. 7, 1980, Ser. No. 166,444
Int. Cl.³ B60P *1/34*
U.S. Cl. 298—11 **2 Claims**



1. In a vehicle having a frame and a bed normally bearing on said frame, said frame having bed supporting rollers at the rear thereof, front arms pivotally connected to the front of said frame, lever arms pivotally connected at opposite ends thereof to said bed and to the free ends of said front arms, extensible power actuated means pivotally connected to the front of said frame and to an intermediate point of said lever arms, the improvement wherein said frame pivotally mounts rear support arms adapted to engage an abutment of said bed at their foreward free ends, a bell crank pivoted to said frame below said rear arms and normally spring urged to accommodate lowering of said rear arms to a position clear of said abutment, selectively operable means for shifting said rear arms into contact with said bed frame adjacent said abutment whereby actuation of said power means elevates said bed with said lever arms and said rear arms substantially defining a parallelogram in combination with said frame and said bed, a releasable latch adjacent said rollers for interconnecting said bed and said frame, and another selectively operable means for releasing said latch.

4,348,055

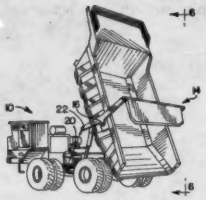
SINGLE CABLE ACTUATED TAILGATE

David B. Meisner, and Dusan M. Vacval, both of Buffalo Grove, Ill., assignors to International Harvester Co., Chicago, Ill.

Filed May 5, 1980, Ser. No. 146,975
Int. Cl.³ B60P *1/26*
U.S. Cl. 298—23 DF **2 Claims**

1. In a vehicle having a pivotable rearwardly unloading dump body mounted on the frame of said vehicle and a pivotally mounted tailgate supported between and attached to respective left and right gate lever arms, each gate lever arm having cable attachment points, said gate lever arms carried on pivot pins located high on the sides of the dump body intermediate the forward wall and the open end of said dump body, the improvement comprising:

a single cable attached to said frame in a movable manner and passing below said frame and extending from said cable attachment point of said left gate lever arm to said cable attachment point of said right gate lever arm, said cable being under equal tension throughout its length when said dump body of said vehicle is raised to a dumping mode,



said attachment of said cable to said frame in a movable manner including:

a first swivel pulley mounted to the left side of said frame through which said cable is passed;

a first guide pulley mounted to the left side of said frame through which said cable is passed;

a second guide pulley mounted to the right side of said frame through which said cable is passed;

a second swivel pulley mounted to the right side of said frame through which said cable is passed.

4,348,056

METHOD FOR ABOVE-GROUND LEACHING OF METAL BEARING ORES AT BELOW-FREEZING TEMPERATURES

Henry Von Kohorn, 22 Perkins Rd., Greenwich, Conn. 06830

Filed Jan. 12, 1981, Ser. No. 224,651
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—4 **9 Claims**

1. A method for above-ground leaching of metal bearing ores in below-freezing atmospheric temperatures which comprises

(a) constructing a first ore body,

(b) providing leach liquor supply and piping means,

(c) providing above and in close proximity to the upper surface of said first ore body a plurality of leach liquor outlets,

(d) depositing on said upper ore surface a second insulating ore layer of such thickness as to cover said leach liquor outlets to a depth sufficient to prevent freezing at prevailing below-freezing atmospheric temperatures of the leach liquor discharged into the first ore body through said outlets, and

(e) introducing leach liquor into the first ore body through said leach liquor outlets.

4,348,057

BLOWER AND DUST COLLECTING MACHINE AND METHOD OF OPERATION

Joseph A. Parenti, 1204 Buckhannon Ave., Morgantown, W. Va. 26505, and Malcolm J. Charles, Lodi, Calif., assignors to B & J Manufacturing Company, Glenwood, Ill., by said Malcolm Jean Charles

Filed Aug. 25, 1980, Ser. No. 181,101
Int. Cl.³ E21C *7/02*; B01D *45/12*
U.S. Cl. 299—12 **26 Claims**

1. Apparatus for maintaining a low dust level in a coal mine about the face of the coal as it is mined comprising

(a) an enclosed blower having an intake opening, an exhaust opening and a main passageway connecting therebetween;

(b) adjustable-length ventilating duct means for establishing

communication of the intake opening of the blower with the coal face;

(c) evacuating means in the exhaust opening of the blower which continuously pulls a column of air through the main passageway of the blower from its air intake opening;

(d) a first stage of closely-spaced, small-diametered, cylindrically-shaped individual centrifuges arranged in said main passageway across the cross section of the main passageway;

(e) said individual centrifuges each having an inlet toward the intake opening, an outlet end toward the exhaust opening of the blower, and means which effectively spin the dust-laden air as it enters the centrifuges such that the dust content is concentrated at the sides of the centrifuges and the central core of the centrifuges is substantially freed of the dust;

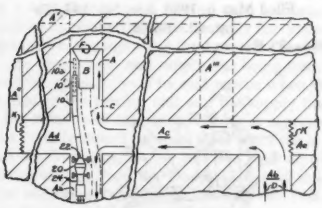
(f) air-tight conduit means establishing a second passage between the evacuating means and the inner sides of the centrifuges against which the dust is concentrated;

(g) said conduit means including a removable dust-collecting bin; and

(h) means in said second passage adapted to discharge the dust from the air in which it is concentrated into the dust-collecting bin;

(i) the second passage communicating with the first passage upstream of the evacuating means such that only the dust-freed portion of the air pulled through said passages is returned through the evacuating means into the mine.

21. A method of maintaining a low level of coal dust in a coal mine comprising the steps of



(a) locating an evacuating fan in the discharge end of a main passageway leading from the coal face being cut so as to draw a mainstream of air from the coal face in which the coal dust particles generated by the coal-cutting action are caught;

(b) dividing said main airstream into smaller diametered columns and spinning each said columns to concentrate the coal dust particles into an annular portion about the dust-freed center core of said columns;

(c) simultaneously causing the exhaust fan to draw said dust-concentrated air from said annular portions of the mainstream and into a communicating secondary passageway which leads from said annular portions of the mainstream to upstream of the evacuating fan;

(d) discharging a portion of said coal dust particles from the stream of air being drawn through the secondary passageway;

(e) collecting said discharged coal dust particles;

(f) concentrating the dust particles remaining in said secondary stream into an indentifiable portion of said second stream; and

(g) separating out and collecting said dust particles from said indentifiable portion;

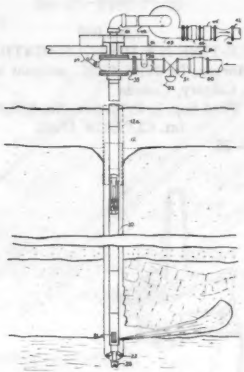
(h) the thus dust-freed secondary airstream combining with the main airstream for discharge into the mine and so that only air of low dust content is discharged by the evacuating fan.

4,348,058

METHOD AND APPARATUS FOR SLURRY BOREHOLE MINING

John E. Coakley, Westfield, and James J. Nolan, Brielle, both of N.J., assignors to Slurry Mining Engineering Inc., Westfield, N.J.

Filed Apr. 1, 1980, Ser. No. 136,283
Int. Cl.³ E21C *45/00, 37/12*
U.S. Cl. 299—17 **25 Claims**



1. A method of hydraulic borehole mining by drilling into a subterranean ore deposit, reducing the ore to a slurry and pumping the ore to the surface with an apparatus which includes a mobile platform having a drilling mast with a vertical hoist for handling the drill string, power slips and wrenching means for assembling the drill string sections intermittently during drilling until the ore strata is reached, a swivel head on the uppermost section of the drill string with the fluid supply connection entering the annular space between the conduits and a slurry discharge connection connected through a swivel to the inner conduit, a dual conduit tool string having a drill bit as its drilling head, drilling fluid controlled by a valve that is normally open during drilling and closed during mining, two hydraulic eductor pumps within the discharge conduit, the first or lower eductor is located at the suction entrance at the base of the tool and is controlled by a valve that is normally open during drilling and closed during mining, the second or slurry eductor is located intermediate of the mining section and below the fluid level in the borehole with fluid jetting from the eductor nozzle during the drilling and mining mode to pump drill cuttings and/or slurry to the surface, a mining nozzle adjacent to the slurry entrance to the tool to erode the ore matrix to form an ore-bearing slurry and controlled by a valve that is normally closed in the drilling mode and open during the mining mode, a flow measuring element and a flow control valve in the fluid supply pipe to the drill string, a flow measuring element and a flow control valve in the discharge conduit from the mining tool; the method comprising the steps of drilling a borehole from the surface to the ore deposit while pumping drilling fluid at drilling system capacity and pressure into the supply conduit and directing the fluid down the annulus between the conduits through a normally open valve to the drill bit and through a normally open control valve supplying fluid to the eductor at the suction entrance and also through the second or slurry eductor nozzle which is open during drilling and mining to pump the drill cuttings to the surface, increasing the capacity and pressure of the supply fluid to mining system conditions, pumping the mining fluid down the annulus between the conduits with the increased fluid pressure actuating the down-hole control valve actuators to convert the tool from the drilling to the mining mode by closing the valve and stopping the flow of fluid to the drill bit and to the lower eductor nozzle while opening the mining nozzle control valve

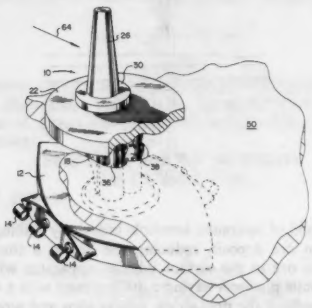
and directing mining fluid through the mining nozzle to reduce the ore to a slurry, rotating the tool string continuously or intermittently during mining, pumping the slurry to the surface by the slurry eductor located within the inner conduit intermediate of the mining section and the discharge of the tool, throttling the flow of fluid from the tool string by the flow control valve in the discharge piping to maintain the fluid level in the borehole sufficient to prevent cavitation in the slurry eductor pump.

4,348,059

MULTIPLE-TINE ICE DISAGGREGATION SYSTEM

George W. Morgan, La Jolla, Calif., assignor to Sun Oil Company, Ltd., Calgary, Canada

Filed Sep. 7, 1978, Ser. No. 940,246
Int. Cl.³ E02B *15/02*
U.S. Cl. 299—25 **3 Claims**



1. In an ice disaggregation system characterized by at least one rotating drum, which drum carries ice engaging teeth structure on the peripheral surface thereof, the improvement comprising:

(A) a plurality of tooth supporting brackets distributed about and affixed to the peripheral surface of the drum, each of said brackets including an elongated tooth carrying portion disposed generally parallel to the drum peripheral surface and rigidly supported outwardly therefrom by a plurality of bracket legs;

(B) a plurality of ice engaging teeth fixed to said bracket beam portion, each of said teeth having a sharp, ice engaging forward portion, said teeth being oriented such that the forward portions thereof generally face the direction of drum rotation; and

(C) said ice engaging portion of said teeth including a plurality of pointed tines comprising a relatively long central tine flanked by a pair of tines which are shorter than said central tine, all of said tines being aimed in the same forward direction.

4,348,060

METHOD FOR MAKING A TUFTED BRUSH

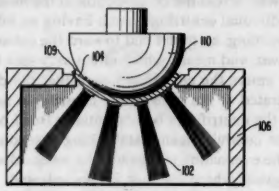
John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Forest Dale, Vt.

Division of Ser. No. 59,479, Jul. 20, 1979, Pat. No. 4,291,431, which is a division of Ser. No. 924,643, Jul. 14, 1978, Pat. No. 4,189,189, which is a continuation-in-part of Ser. No. 757,564, Jan. 7, 1977, Pat. No. 4,109,965. This application Mar. 10, 1981, Ser. No. 242,190
Int. Cl.³ B29C *17/02, 27/02*
U.S. Cl. 300—21 **5 Claims**

1. A method for forming a tufted, flared brush construction wherein each tuft is disposed at an angle different from each adjacent tuft comprising:

providing a thermoplastic sheet substrate, supporting said sheet at the edges thereof, and heating said sheet until it softens;

providing a plurality of synthetic filament tufts, supporting said tufts in a mutually spaced parallel relationship, and heating a common end of each of said tufts, simultaneously, until each of said ends fuses;



simultaneously fusing said ends of each of said tufts to a surface of said heat softened substrate to mount said tufts thereon in the parallel mutually spaced relationship;

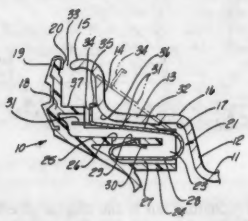
then deforming said heat softened sheet while supported only by the edges into a convex configuration to form said flared construction with said tufts extending outwardly therefrom.

4,348,061

WHEEL COVER RETENTION

James T. Bowling, Grosse Pointe Farms, Mich., assignor to J. Connell Associates, Bloomfield Hills, Mich.

Filed May 6, 1980, Ser. No. 147,420
Int. Cl.³ B60B *7/00*
U.S. Cl. 301—37 R **6 Claims**



1. A wheel cover adapted for attachment to an annular axial flange of a vehicle wheel wherein the axially outer portion of said axial wheel flange is connected by an arcuate cam portion with a generally radially directed wheel flange, said cover having a plurality of circumferentially spaced spring clips, each clip comprising a retention arm having a generally axially extending portion resiliently yieldable radially for enabling coaxial movement of said cover toward said wheel and for engaging said wheel flange with radially directed spring force to effect said attachment, each clip comprising a fixed portion secured to said cover and an axially outwardly opening loop resiliently connecting said fixed and axially extending portions for resiliently urging said axially extending portion into said engagement with said axial flange when said cover is moved coaxially toward said wheel, and means to facilitate coaxial alignment of said cover and wheel in predetermined axially spaced relationship comprising locating means of said retention arm for engaging said wheel and camming said axially extending portion radially in the direction opposing said spring force to prevent said attachment when said retention arm is moved axially toward said wheel beyond a predetermined limit, said locating means comprising an axially outer portion of said axially extending portion adapted to engage said cam portion, a locating arm secured to said retention arm for mov-

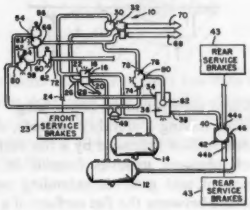
ing therewith and extending radially from said axially outer portion of said retention arm when said cover is attached to said wheel, said cover having movement limiting means projecting axially inward toward said locating arm and terminating at a location adjacent to and spaced axially outwardly therefrom to limit resilient yielding of said loop and axially outward movement of said locating arm and attached retention arm.

4,348,062

TRACTOR AIR BRAKE PROPORTIONING SYSTEM

James P. Koenig, Cuyahoga, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 14, 1980, Ser. No. 178,225
Int. Cl.³ B60T *8/18, 8/26*
U.S. Cl. 303—6 C **2 Claims**



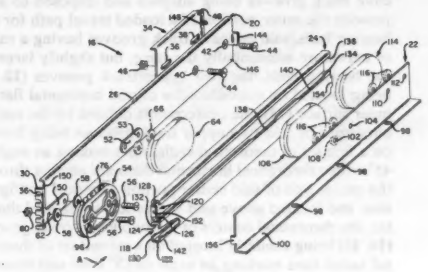
1. In a fluid pressure braking system for an articulated vehicle having a towed unit and a towing unit, a source of fluid pressure carried by the towing unit, a supply line interconnecting said units for communicating fluid pressure from the towing unit to the towed unit, said supply line being maintained at a predetermined pressure level by said source when the towed unit is coupled to the towing unit and the supply line is connected to the latter, said supply line being at a pressure level less than the predetermined pressure level when the towed unit is disconnected from the towing unit and said supply line is thereby disconnected from the towed unit, said towing unit having front and rear service brakes and a service brake actuating system, characterized in that said service brake actuating system includes proportioning valve means, said proportioning valve means being responsive to the pressure level in said supply line for communicating a pressure level to said rear service brakes on the towing unit that is less than the pressure level communicated to said proportioning valve means over at least a portion of the range of actuating pressures in said service brake system when the pressure level in said supply line is below said predetermined level, said proportioning valve means communicating substantially the same pressure level to said rear service brakes as is the pressure level communicated to said proportioning valve when the pressure level in said supply line is above said predetermined level, whereby a proportioned brake pressure level is communicated to said rear service brakes when the towing unit is disconnected from the towed unit and an unproportioned brake pressure level is communicated to said rear service brakes when the towed unit is connected to the towing unit, said proportioning valve means including a housing having a control port, an inlet port, and an outlet port, and valve mechanism for controlling communication between the inlet and the outlet ports, said valve mechanism being responsive to the pressure level at said control port to proportion communication between the inlet and outlet port over at least a portion of the range of actuating pressures, said braking system further including an inversion valve having a first port connected to said fluid pressure source, a second port connected to said control port of the proportioning valve, and a third port connected to said supply line, said inversion valve including means responsive to the pressure level at said third port to open communication between the first and second ports when the pressure at the third port is below a predetermined value and to vent said second port when the pressure level is above said predetermined value.

4,348,063

BALL BEARING SLIDE

William I. Chambers, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1980, Ser. No. 219,758
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—3.8 **5 Claims**



1. A slide assembly comprising:

first, second, and third track members, with said third track member being positioned between said first and second track members;

means for attaching said first track member to a support member;

said third track member having first and second U-shaped channels extending along the length thereof, with said first and second U-shaped channels having the associated open sides thereof facing said first and second track members, respectively;

said first track member having first bearing means secured thereto to engage said first U-shaped channel in bearing relationship therewith; and

said second track member having second bearing means secured thereto to engage said second U-shaped channel in bearing relationship therewith to enable said second and third track members to be extended and retracted with respect to said first track member;

each said first and second bearing means comprising recirculating ball bearings in said bearing relationship;

said first bearing means comprising first and second spaced-apart, bearing units; and

each of said first and second spaced-apart bearing units comprising:

first and second plates facing each other and also being shaped to form an endless recirculating track therebetween, with said recirculating ball bearings being located in said endless recirculating track;

each of said endless recirculating tracks having first and second straight portions located on opposed sides thereof, with said recirculating ball bearings located in said first and second straight portions providing said bearing relationship with said first U-shaped channel.

4,348,064

LINEAR BALL BEARING UNIT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa Setagaya-ku, Tokyo, Japan (158)

Filed Sep. 22, 1980, Ser. No. 189,903
Claims priority, application Japan, Oct. 20, 1979, 54/135580
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **2 Claims**

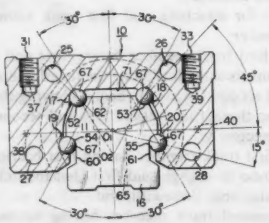
1. A linear ball bearing unit, comprising in combination:

a. an elongated bearing main body having front and rear end surfaces (**23, 24**);

b. an elongated hollow center portion defined between said end surfaces, said center portion being defined from a cylindrical configuration but having a horizontal flat top inner surface (**71**), an open bottom, and curved sides symmetrically disposed around the center axis of said cylindrical configuration;

c. two upper and two lower concave longitudinal parallel outer track grooves (**12, 13, 14, 15**) defined in said center portion, with loaded bearing balls (**67**) therein, said concave track grooves being adapted and disposed so as to provide the outer portion of a loaded travel path for said bearing balls, said concave track grooves having a radius of curvature substantially the same, but slightly larger as the bearing balls, the two upper track grooves (**12, 13**) being located on opposite sides of said horizontal flat top inner surface (**71**), the centerpoints defined by the radii of curvature of said two upper track grooves being located on a first set of theoretical radial lines making an angle of 45° with a theoretical horizontal diameter passing through the center axis of said center portion spherical configuration, and located above said theoretical horizontal diameter, the theoretical centers of the two lower track grooves (**14, 15**) being similarly located on a second set of theoretical radial lines marking an angle of 15° with said theoretical horizontal diameter, but located below said horizontal diameter;

d. an elongated track table (**16**) disposed in said center portion havig two upper and two lower inner grooves for



tracks (**52, 53, 54, 55**) defined therein corresponding to the outer track grooves so as to hold said bearing balls (**67**) therein, said track table having a theoretical cross-sectional configuration axially aligned with said hollow center portion, with a flat upper surface (**62**) disposed opposite said flat top inner surface (**71**), said inner grooves for tracks having a radius of curvature corresponding to that of the outer track grooves, the centerpoints of the radii of curvature of said two upper inner grooves being located on said first set of radial lines while the centerpoints of the radii of curvature of said two lower inner grooves being located on said second set of radial lines, said inner track grooves providing the inner portion of a loaded travel path for loaded balls in cooperation with the corresponding outer portion of a loaded travel path definedfor providing a non-loaded return travel path for the bearing balls, each of said non-loaded travel paths being adjacent to an outer track groove, each of said non-loaded travel paths having a radius of curvature substantially the same but slightly larger than that of the bearing balls and having centerpoints located on said first and second theoretical radial lines and each being equally spaced from its adjacent outer track groove as the other non-loaded travel paths;

f. caps (**44, 45, 46, 47**) disposed over the front and rear ends of said bearing main body connecting the defined loaded travel paths with the non-loaded travel paths, each cap having a U-shaped portion so that the bearing balls can pass between the loaded and non-loaded travel paths; and,

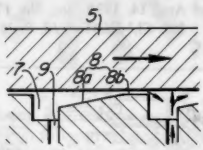
g. semi-circular guide tongues (**48, 49, 50, 51**) defined in the caps to charge direction of travel of the rolling bearing balls (**67**).

4,348,065

THRUST BEARING

Masahiro Yoshioka, Ibaraki, and Toshifumi Koike, Shimoinayoshi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 167,398
Claims priority, application Japan, Jul. 13, 1979, 54-88133
Int. Cl.³ F16C *32/06, 33/10*
U.S. Cl. 308—9 **4 Claims**



1. A tapered-land thrust bearing comprising:

a bearing surface having a plurality of lands, each of which has a tapered surface followed by a flat surface;

a plurality of lubricant grooves formed on said bearing surface, each of said grooves extending radially of the bearing surface between the flat surface of a circumferentially preceding land and the tapered surface of a circumferentially following land; wherein the improvement comprises at least one axially oriented lubricant feeding nozzle hole being formed in each of said lubricant grooves, each said nozzle hole having a diameter which is substantially smaller than the width of the lubricant grooves and being disposed in a bottom surface thereof at a position adjoining a leading edge of a tapered surface of the respective following land in a manner forming lubricant jet means for minimizing hot oil carry-over from the flat surface of the respective preceding land to said tapered surface of the following land by causing hot oil from the preceding flat surface to be discharged through the respective lubricant groove within which the nozzle hole is formed.

4. A tapered-land thrust bearing comprising:

a bearing surface;

a plurality of lubricant grooves formed on said bearing surface and extending radially thereof; and

a plurality of tapered surfaces and flat surfaces, each tapered surface and each flat surface being disposed between the adjacent lubricant grooves extending radially of the bearing surface; wherein the improvement comprises each of said lubricant grooves having a peripheral dimension greater than the peripheral dimension of the tapered surface and the flat surface interposed between the adjacent lubricant grooves, and a plurality of lubricant feeding nozzle holes formed in said lubricant grooves, at least one of said nozzle holes being disposed close to the respective tapered surface of said bearing surface.

4,348,066

FOIL BEARING MOUNTING

Giridhari L. Agrawal, Torrance, and Edward J. Hockey, Vista, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 47,601, Jun. 11, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,061
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **13 Claims**

1. A fluid bearing comprising:

a pair of members arranged for relative movement with respect to one another, one of said pair of members having a plurality of circular slots having a depth less than the diameter but greater than the radius of the slots to form lip

means at the edge of the slots at the surface of said one of said pair of members; and

a plurality of compliant foils operably disposed between said pair of relatively movable members, each of said plurality of compliant foils having at one end thereof a circular loop

having an outer diameter slightly less than the diameter of the circular slots, said loop pivotably disposed in a corresponding circular slot of said one of said pair of relatively movable members and restrained by the lip means at the edge of the slot.

4,348,067

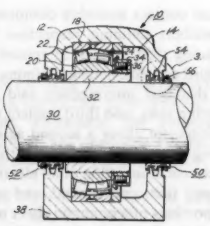
BEARING SEAL

Robert W. Tooley, Osceola, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Mar. 3, 1980, Ser. No. 126,451

Int. Cl.³ F16J *15/32*

U.S. Cl. 308—187.1 **16 Claims**



1. A seal for a shaft bearing having a housing with an opening therein for receiving a shaft: said seal comprising a sleeve for receiving a shaft, said sleeve extending through said opening for the shaft and being elongated and positioned axially with respect to the shaft and providing relative axial movement between the shaft and sleeve, a labyrinth sealing section having intermeshing, radially extending, annular grooves and ribs on the inner periphery of the opening and on the external periphery of said sleeve, an annular radially extending sealing surface on the housing adjacent one end of the opening in the housing, and a V-ring seal mounted on said sleeve adjacent said labyrinth section and spaced axially therefrom and having a lip thereon for seating on said radially extending sealing surface, the shaft being capable of sliding axially relative to the sleeve during operation of the bearing to permit expansion and contraction of the shaft, thereby maintaining the proper operating relationship between the various parts of the combination seal on the shaft and in the housing.

4,348,068

REFRIGERATOR CASING

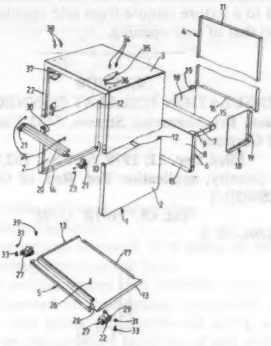
Harold R. Hawkins; Clive A. Gardner; Lindsey J. Roke; Richard J. Clark, and Warwick F. Rumble, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Jan. 22, 1980, Ser. No. 114,329

Claims priority, application New Zealand, Jan. 26, 1979, 189489

Int. Cl.³ A47B *43/00, 81/00*

U.S. Cl. 312—257 R **3 Claims**



1. A casing comprising a shell member having a transverse cross section in the form of a substantially square bottomed U, a bottom panel closing part of the space between the ends of the arms of said U-shaped shell member opposite the base of said U-shaped shell member, a back panel closing part of the space between said arms of said shell member, said bottom panel and said back panel not extending to a common boundary, a compartment panel engaged between said back panel and said bottom panel, and end panels at the ends of said compartment panel which are positioned adjacent said outer shell, said end panels having spacing flanges thereon so that a gap is provided between said outer shell and said end panels.

4,348,069

CABINETS AND DOORS THEREFOR

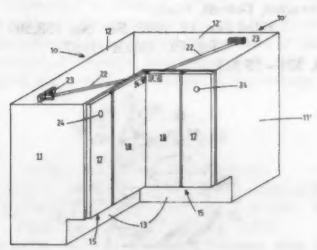
John A. Lindsay, Invercargill, New Zealand, assignor to Lynwood Products Limited, Invercargill, New Zealand

Filed Apr. 23, 1980, Ser. No. 142,882

Claims priority, application New Zealand, Apr. 26, 1979, 190289

Int. Cl.³ A47B *81/00*; E05F *1/08*

U.S. Cl. 312—324 **17 Claims**



1. In a cupboard having an opening defined at least in part by two lateral parallel walls a door for closing the opening said door comprising a planar closure member having one edge hingedly mounted to one of said lateral walls and a second

edge which is parallel to said first edge engageable with the other lateral wall when said closure member is in the closed position, the closure member being formed in two sections of different width, said sections being hingedly interconnected along adjacent edges which are parallel to said first and second edge so that said two sections fold back parallel to and against one another when the closure member is in the fully opened position, said closure member in said fully open position being located outside said cupboard with the said second edge adjacent the edge of the lateral wall to which said first edge is hingedly connected, and an arm pivotally mounted by one end to said closure member adjacent said second edge and at its other end to a fixture remote from said opening but in a plane parallel to that of said opening.

4,348,070

INSULATION FOR FLAT CONNECTORS

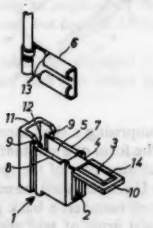
Hans Simon, Bruchhausener Strasse, 5463 Unkel, Rhein, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,976

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 7925002[U]

Int. Cl.³ H01R *13/48*

U.S. Cl. 339—59 R **5 Claims**



1. Insulation apparatus for flat connectors comprising a unitary plastic housing including a first narrow side wall and a second side wall extending substantially transversely to said first side wall, an embedding opening being formed in said first side narrow wall and an insertion opening being formed in said second side wall, a lid integrally connected to said housing by a hinge frame proximate to said insertion opening such that said lid is rotatable to partially close said embedding opening, and at least one latch means integrally formed on said housing for arresting said lid when the latter closes said embedding opening.

4,348,071

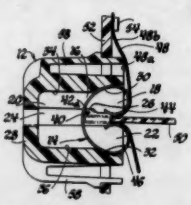
PRINTED CIRCUIT CONNECTOR

Shao-Chung Hsieh, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1980, Ser. No. 158,502

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—75 MP **3 Claims**



1. A connector for mating a flexible printed circuit to a printed circuit board comprising:

a housing having a cavity and a spring disposed in the cavity,

said spring having a resilient body and first and second sets of laterally spaced, resilient fingers which are at respective ends of the body and which curve inwardly from the respective ends,

the fingers of the first set having convex portions spaced from convex portions of the fingers of the second set to define a lateral slot,

said cavity having an entrance portion at one end and a second portion of reduced height inwardly of the entrance portion, said spring being initially disposed in the entrance portion for receiving a flexible printed circuit and a printed circuit board in the lateral slot,

means for temporarily retaining the spring in the entrance portion so that the convex portions of the fingers are moveable relative to the housing while the flexible printed circuit and the printed circuit board are inserted into the lateral slot against the body of the spring, and

said spring being moveable into the second portion of the cavity responsive to further insertion of the flexible printed circuit and the printed circuit board.

4,348,072

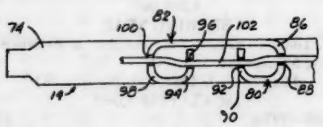
INSULATION DISPLACING ELECTRICAL CONTACT ASSEMBLY

Bernard V. Gudaitis, Elgin, Ill., assignor to Thomas & Betts Corporation, Raritan, N.J.

Division of Ser. No. 955,239, Oct. 26, 1978, Pat. No. 4,209,217. This application Dec. 12, 1979, Ser. No. 102,770

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—97 R **10 Claims**



1. An electrical contact assembly comprising first and second contact members defining respective first and second insulation displacing slots aligned in spaced relation along a first axis and a third contact member defining a third insulation displacing slot disposed intermediate said first and second insulation displacing slots, said third contact member biasingly disposing said third slot along a second axis offset from said first axis and being movable to dispose said third slot along said first axis in the course of insertion of an electrical conductor in said assembly, said first, said second, and said third contact members being portions of a common sheet member, said first, second and third insulation displacing slots being mutually disposed in a common direction for jointly receiving a common length of wire therein.

4,348,073

FRANGIBLE POLARIZING RIB FOR MULTIPLE CONTACT HEADER

Sidney V. Worth, Flourtown, and Keith D. Nelson, Willow Grove, both of Pa., assignors to Continental-Wirt Electronics Corp., Warminster, Pa.

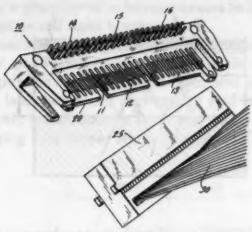
Filed Jun. 27, 1980, Ser. No. 163,740

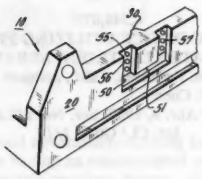
Int. Cl.³ H01R *13/645*

U.S. Cl. 339—186 M **9 Claims**

9. The structure of claim 1 or 5, wherein said reduced wall thickness slots consist of first and second spaced, parallel reduced thickness slots which extend from the outer edge of said first wall and are perpendicular to said first wall; and a channel extending through said first wall and communicating with the ends of said first and second slots, whereby said first and sec-

ond slots and said channel define the area of said frangible section and define an opening with sharp, regular sides when





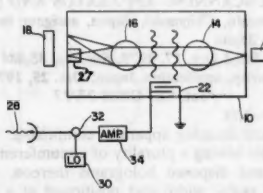
said frangible section is removed from said first wall by breaking it out along said first and second slots.

4,348,074

APPLICATION OF ION IMPLANTATION TO $LINBO_3$ INTEGRATED, OPTICAL SPECTRUM ANALYZERS

William K. Burns, Alexandria, and Thomas G. Giallorenzi, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1980, Ser. No. 126,268
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.11 **15 Claims**



1. In an improved integrated optical spectrum analyzer, including a waveguide, a substrate, a light source, a collimator lens, a transform lens, a light-detector array and a SAW means, the improvement comprising:

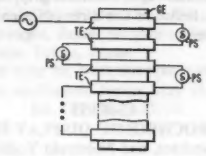
light-absorbing means within said substrate paralleling the bottom of said substrate.

4,348,075

BULK ACOUSTIC WAVE INTEGRATED OPTICAL DEFLECTOR AND MONOLITHIC A/D CONVERTER USING SUCH DEFLECTOR

Milton Gottlieb, Pittsburgh, and Gerald B. Brandt, Edgewood Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 9, 1979, Ser. No. 82,513
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.13 **15 Claims**



1. In a monolithic deflector comprising:

a slab of substrate material;

an optical waveguide disposed in a plane of said slab in which is propagated incident light;

a plurality of parallel spaced bulk acoustic wave transducer elements disposed on said optical waveguide in a plane parallel to said plane and distributed along a direction transverse to the operative direction of said optical waveguide for passing respective ultrasonic bulk acoustic waves through parallel channels of said optical waveguide and in a direction normal thereto for interaction with light guided in said parallel channels, respectively

said transducer elements including: respective top electrodes, a common ground electrode disposed on said waveguide, an optical insulator of refractive index less than said waveguide interposed between said ground electrode and said waveguide; piezoelectric material sandwiched between said ground electrode and a corresponding one of said top electrodes; said piezoelectric material and said top electrode being coextensive and spaced from one transducer element to the other by a predetermined spacing s, and said transducer elements having a length l in the operative direction of said optical waveguide such that l is substantially larger than said spacing s; the deflection angle caused by acoustic-optic interaction being defined by $\sin \phi = \lambda/s$; the combination of:

a plurality of controllable phase shifters associated with the respective transducer elements for introducing cumulative phase shifts of identical relative magnitude between consecutive transducer elements; and

a voltage signal applied to said transducer elements through the associated phase shifters for establishing by acoustic-optic interaction a selected deflection angle for said guided light which is proportional to the change of refractive index caused by said phase shifters and to the length of propagation through said transducers, said selected deflection angle being in relation to the voltage of said signal.

4,348,076

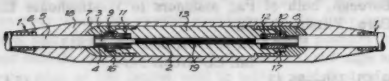
FIBRE-OPTIC CABLE JOINTS

Ronald C. Oldham, Chandlers Ford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 29, 1979, Ser. No. 70,580
Claims priority, application United Kingdom, Oct. 3, 1978, 39147/78
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.22 **13 Claims**

7. A ferrule for use in joining two fibres arranged in a respective tubular strength member, comprising respective means whereby to grip the end of the strength member at each cable

end, a tubular ferrule body comprising one or more longitudinally-split portions and means associated with each end of the ferrule body for clamping the portions of the ferrule body



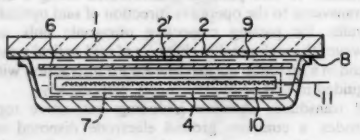
together and to the strength member, gripping means such as to transfer strain between the strength members of the two cables in use thereof.

4,348,077

ELECTROCHROMIC DISPLAY DEVICE

Shigeo Kondo, Hirakata, and Nobuyuki Yoshiike, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 19, 1979, Ser. No. 95,380
Claims priority, application Japan, Nov. 20, 1978, 53-143649; Jul. 17, 1979, 54-90600
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 55 Claims



1. An electrochromic display device having a display memory function, comprising:

an electrolyte;

at least one display electrode disposed in contact with said electrolyte;

at least one counter electrode spaced from said display electrode and disposed in contact with the electrolyte, said counter electrode containing at least berlinate which is insoluble in the electrolyte; and

means for applying first and second electric potentials between said display and counter electrodes for causing reversible oxidation and reduction reactions on the electrodes,

said first electric potential being substantially constant to cause a stable display to appear on the display electrode which display is maintained even after removal of said first electric potential, said second electric potential being applied to cause the display to disappear.

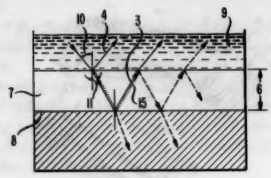
4,348,078

ENHANCEMENT OF OPTICAL ABSORPTION AND CONTRAST OF ELECTROCHROMIC DEVICES

James D. E. McIntyre, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 30, 1980, Ser. No. 173,813
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 7 Claims

1. An electrochromic device comprising (1) an electrolyte in intimate contact with both an electochromic layer of (2) an electrochromic electrode, and with a (3) counterelectrode, characterized in that said electrochromic layer includes means for receiving incident light at an angle other than 90 degrees to the surface of said layer, said electrochromic electrode includes a reflective backing surface, and the dimensions of said electrochromic electrode that determine the optical path



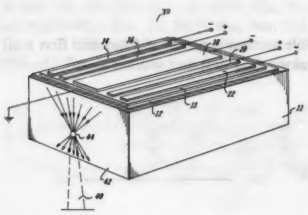
length from said surface of said electrochromic layer to said reflective surface and back produces destructive interference.

4,348,079

ACOUSTO-OPTIC DEVICE UTILIZING FRESNEL ZONE PLATE ELECTRODE ARRAY

Richard V. Johnson, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 8, 1980, Ser. No. 138,629
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 5 Claims



1. In a laser scanning system including a Bragg acousto-optic device and a laser source directing a laser light beam through an acousto-optic medium within said Bragg device, the improvement of apparatus for focusing a sound field in said Bragg device, said improvement comprising:

a Fresnel zone plate electrode array bonded to one surface of said medium, and

means for driving each electrode of said array with a radio frequency voltage of sufficient magnitude to activate said acousto-optic device to modulate and/or deflect said laser light beam passing through said acousto-optic medium.

4,348,080

OPTICAL SCANNING APPARATUS AND METHOD

Hiroyoshi Funato, Chigosaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 17, 1979, Ser. No. 85,486
Claims priority, application Japan, Oct. 25, 1978, 53/131332
Int. Cl.³ G02B 27/17
U.S. Cl. 350—3.71 1 Claim

1. An optical scanning apparatus comprising:

a rotary disc having a plurality of circumferentially equally spaced and disposed holograms thereon, all having a selected radial width and positioned at a single radial position on said disc, each hologram being of a type which is prepared by the interference of a reference light beam with an object light beam;

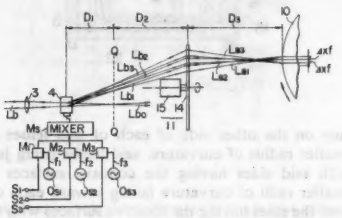
a motor connected to said rotary disc for rotating said rotary disc continuously at a predetermined speed; and

reconstruction beam generating means associated with said rotary disc for generating a plurality of diverging fixed information-carrying beams each at an acute angle to each

other, and directing them toward and through each of said holograms sequentially, said selected radial width of each of said holograms being sufficient to receive all said information-carrying beams, said information-carrying beams acting as a plurality of reference beams to form a plurality of reconstructed light beams;

said reconstruction beam generating means comprising a laser for producing a laser beam, beam expanding and converging lens means spaced from said laser for receiving said laser beam and converging said laser beam;

acousto-optic means spaced from said beam expanding and converging lens means for receiving said laser beam and



producing said information-carrying beams, said acousto-optic means having an uninterrupted path to said disc for said information-carrying beams; and electric circuit means connected to said acousto-optic means for producing information signals and applying said information signals to said acousto-optic means to produce said information-carrying beams, said circuit means producing a plurality of information signals each at a different frequency for producing, in said acousto-optic means, the information-carrying beams which are each directed through said holograms, said information-carrying beams all being scanned in a direction contained in a plane which is parallel to a plane containing said rotary disc.

4,348,081

PROJECTION LENS

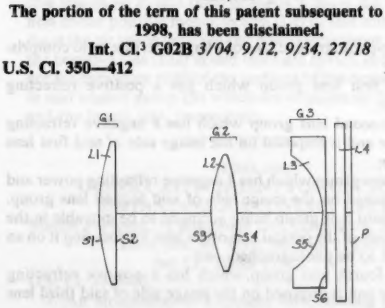
Ellis I. Betensky, New York, N.Y., assignor to U.S. Precision Lens Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 70,748, Sep. 5, 1979, Pat. No. 4,300,817, which is a continuation-in-part of Ser. No. 940,724, Sep. 6, 1978, abandoned. This application Jan. 28, 1981, Ser. No. 228,012

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ G02B *3/04, 9/12, 9/34, 27/18*

U.S. Cl. 350—412 **22 Claims**



1. A projection lens for a cathode ray tube display consisting of three groups, the first group from the image end comprising an element having at least one aspheric surface, the second group comprising a bi-convex element, the third group consisting a negative element having an aspheric surface concave to the image and serving as a field flattener essentially correcting the Petzval curvature of the first and second groups, said three groups have optical powers K1, K2 and K3, the overall lens has an optical power of 1.0, and

$$0.25<K1<0.50$$

$$0.85<K2<1.20$$

$$-1.3<K3<-0.9$$

4,348,082

ZOOM LENS HAVING HIGH ZOOM RATIO INCLUDING WIDE ANGLE RANGE

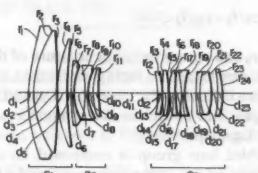
Ryota Ogawa, Kawagoe, Japan, assignor to Asahi Kogalu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,410

Claims priority, application Japan, May 16, 1979, 54-60040

Int. Cl.³ G02B *15/14*

U.S. Cl. 350—423 **5 Claims**



1. A zoom lens wherein a resultant refractive power is determined by a positive first lens group, a negative second lens group and a positive third lens group arranged in that order from the object side, said first and third lens groups being integrally movable along the optical axis to thereby vary the zoom ratio, a compact zoom lens system having a high zoom ratio including a wide angle range characterized in that:

(a) said second and third lens groups are adapted to simultaneously increase respective zoom ratios, said zoom lens satisfying the following conditions:

$$0.9<e_{2W}/f_3<1.4,$$

$$1.8<f_1/f_W<2.6$$

$$-2.8<(f_1-e_{1T})/f_2<-1.6, \text{ and}$$

$$0.7<f_3/f_W<1.3$$

where f_1, f_2 and f_3 are the focal lengths of the first, second and third lens groups, respectively, e_{2W} is the distance between the principal points of said second and third lens groups at the wide angle end of said lense, e_{1T} is the distance between the principal points of said first and second lens groups at the telephoto end of said lens, and f_W is the overall focal length at the wide angle end of said lens;

(b) said first lens group is composed, in order from the object side, of a negative meniscus lens L_1 having a strong negative lens power toward the image side, a positive lens L_2 having a strong positive lens power toward the object side and a positive meniscus lens L_3 having a strong positive power toward the object side, the lenses L_1 and L_2 being cemented to each other, said first lens group satisfying the following conditions:

$$1.75<n_1,$$

$$n_2<1.7,$$

$$1.65<n_3<1.75,$$

$$\nu_1<30, \text{ and}$$

$50<(\nu_2+\nu_3)/2$

where n_1, n_2 and n_3 are the refractive indices of the lenses L_1, L_2 and L_3, respectively, and ν_1, ν_2 and ν_3 are the Abbe numbers of the lenses L_1, L_2 and L_3, respectively;

(c) said second lens groups is composed, in order from the object side, of a negative meniscus lens L_4 having a strong negative lens power toward the image side, a negative lens L_5 and a positive lens L_6 having a strong positive lens power toward the object side, said second lens group satisfying the following conditions:

$1.7<(n_4+n_5)/2$,

$1.75<n_6$,

$45<(\nu_4+\nu_5)/2$,

$\nu_6<30$, and

$0.15<r_9/f_2-r_{10}/f_2<0.30$

where r_9 and r_{10} are radii of curvature of the lens surfaces of the lenses L_5 and L_6 facing each other, n_4, n_5, n_6 are the refractive indices of the lenses L_4, L_5 and L_6, respectively, and ν_4, ν_5, and ν_6 are the Abbe number of the lenses L_4, L_5 and L_6, respectively;

(d) said third lens group is composed, in order from the object side, of a positive meniscus lens L_7 having a strong negative lens power toward the object, a biconvex lens L_8, positive lens L_9, a negative lens L_{10}, a negative meniscus lens L_{11} having a strong negative lens power toward the image, a biconvex lens L_{12} and a positive lens L_{13}, the lenses L_{11} and L_{12} being cemented to each other, said third lens group satisfying the following conditions:

$-3f_3<r_{12}<-f_3$,

$0.6f_3<r_{19}<1.5f_3$,

$0.4f_3<r_{21}<0.8f_3$,

$n_{10}>1.70$,

$0.2<n_{11}-n_{12}$,

$\nu_{10}<10$, and

$15<\nu_{12}-\nu_{11}$

where n_7, n_8, . . . , n_{13} are the refractive indices of the lenses L_7, L_8, . . . , L_{13}, respectively, ν_7, ν_8, . . . , ν_{13} are the Abbe numbers of the lenses L_7, L_8, . . . , L_{13}, respectively, and r_{12}, r_{19}, r_{21} are the radii of curvature of the object side surface of the lens L_7, the image side surface of the lens L_{10} and the image side surface of the lens L_{11}, respectively.

4,348,083

CRIME PREVENTIVE DOOR VIEWER

Yasushi Kamimura, 3-3, Chuou 2-chome, Outa-ku, Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,303
Claims priority, application Japan, Apr. 5, 1979, 54-43957
Int. Cl.³ G02B *25/04*
U.S. Cl. 350—453 **7 Claims**

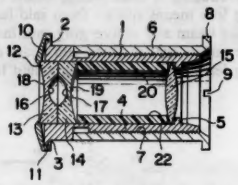
1. A wide-angle lens assembly particularly suitable for use as a door viewer having an image side and an object side comprising:

an eyepiece mounted proximate said image side of said lens assembly;

a first and a second objective lens juxtaposed adjacent said image side of said lens assembly; and

focal length means intermediate said eyepiece and said first and second lenses to maintain a desired distance therebetween;

said first and said second objective lenses being identically formed each with concave surfaces on the opposite sides thereof, the concave surface on one side of each lens having a larger radius of curvature and the concave surface on the other side of each of said lenses having a smaller radius of curvature, said lenses being juxtaposed with said sides having the concave surfaces with the smaller radii of curvature facing toward each other and with the sides having the concave surfaces with the larger radii of curvature facing away from each other.

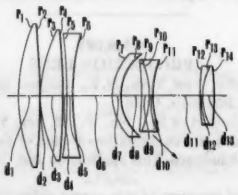


4,348,084

TELE-PHOTOGRAPHIC LENS OF LARGE APERTURE RATIO

Nozomu Kitagishi, Kawasaki, and Kazuo Fujibayashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1980, Ser. No. 144,989
Claims priority, application Japan, May 7, 1979, 54-55474
Int. Cl.³ G02G *9/62*; G02B *13/02*
U.S. Cl. 350—454 **11 Claims**



1. A tele-photographic lens of a large aperture ratio comprising:

a fixed first lens group which has a positive refracting power;

a fixed second lens group which has a negative refracting power and is disposed on the image side of said first lens group;

a third lens group which has a negative refracting power and is disposed on the image side of said second lens group, said third lens group being arranged to be movable in the direction of the optical axis of the lens for focusing it on an object to be photographed; and

a fixed fourth lens group which has a positive refracting power and is disposed on the image side of said third lens group;

wherein, when said tele-photographic lens is focused on an object located at infinity, the compound focal length of the first, second and third lens groups is f(I,II,III) and the focal length of the whole lens system is fT, said tele-photographic lens is arranged to satisfy the following condition:

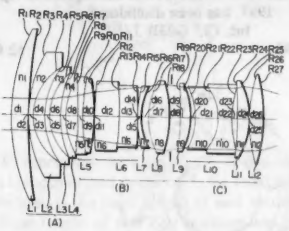
$2\ fT<f(I,\ II,\ III)<2.6\ fT$

4,348,085

INVERTED TELEPHOTO TYPE WIDE ANGLE LENS

Satoshi Mogami, Kodaira, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,962
Claims priority, application Japan, Jul. 26, 1979, 54-95535
Int. Cl.³ G02B *13/04*
U.S. Cl. 350—458 **4 Claims**



1. An inverted telephoto type wide angle lens comprising, in succession from the object side, a divergent first group (A) including a positive meniscus lens (L_1) having its convex surface facing the object side, and negative meniscus lenses (L_2–L_4) having their convex surfaces facing the object side; a diaphragm-forward convergent second group (B) including positive lenses (L_5, L_6), a positive lens (L_8) and a negative meniscus lens (L_7) disposed between said positive lenses (L_5, L_6) and said positive lens (L_8) and having its convex surface facing the object side; and a diaphragm-rearward convergent third group (C) including a positive meniscus lens (L_9) having its convex surface facing the image side, positive lenses (L_{11}, L_{12}) and a doublet biconcave negative lens (L_{10}) disposed between said positive meniscus lens (L_9) and said positive lenses (L_{11}, L_{12}); said inverted telephoto type wide angle lens satisfying the following conditions:

$$d_{21}+d_{22}>0.5f \quad (I)$$

$$d_{19}>d_{20} \quad (II)$$

$$0.45R_{15}<R_{16}<0.73R_{15} \quad (III)$$

where f is the total focal length of the entire system, $(d_{21}+d_{22})$ is the center thickness of the lens forming the biconcave negative lens (L_{10}) in said third group (C), d_{19} is the center thickness of the positive meniscus lens (L_9) in said third group (C), d_{20} is the air space between the positive meniscus lens (L_9) and the negative lens (L_{10}) in said third group (C), and R_{15} and R_{16} are the curvature radii of the surfaces of the negative lens (L_7) in said second group (B) which are adjacent to the object side and the image side, respectively.

4,348,086

CAMERA ATTACHMENT FOR OBTAINING INSTANTANEOUS CONTACT PRINTS

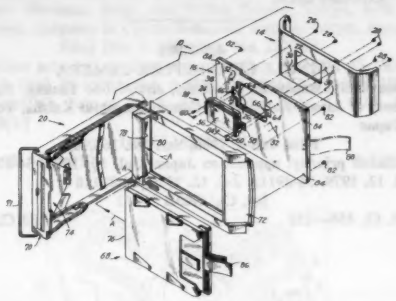
Martin Forscher, 71 Deepwood Dr., Chappaqua, N.Y. 10514

Filed Oct. 30, 1981, Ser. No. 316,851
Int. Cl.³ G03B *17/52, 17/56*
U.S. Cl. 354—83 **9 Claims**

7. An attachment to a camera for obtaining instantaneous prints of pictures taken by said camera comprising,

(a) a fiber optic face plate having opposed front and rear surfaces adapted to be secured to the back of said camera with said front surface being in the focal plane of said camera whereby an image formed on said front surface is transferred to said rear surface, and

(b) a housing adapted to receive instant picture forming film adapted to be secured to said camera so that picture forming film in said housing is in surface to surface contact with the rear surface of said fiber optic face plate whereby the image formed on said front surface is automatically



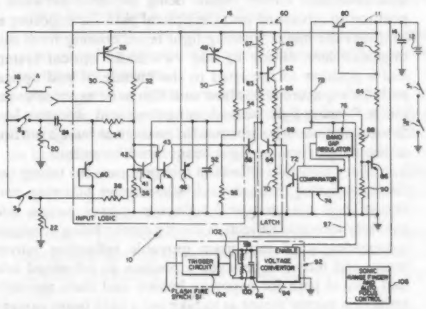
transferred to said film to enable instantaneous printing of said image on said film.

4,348,087

PHOTOGRAPHIC SYSTEM FOR AUTOMATICALLY CHARGING ELECTRONIC FLASH

Seymour Ellin, Chestnut Hill, and John W. Stempeck, Reading, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 3, 1981, Ser. No. 250,853
Int. Cl.³ G03B *15/03*
U.S. Cl. 354—139 **18 Claims**



1. A photographic control system for use with a camera and electronic flash apparatus of the type having a converter circuit for converting a low DC voltage to a select high DC voltage stored by a capacitor for subsequent discharge through a flashtube to effect a flash of artificial illumination, said control system comprising:

switch means for closing an electrical connection in response to the readying of the camera in anticipation of implementing a photographic exposure cycle; and control means responsive to the closing of said switch means for enabling the converter to operate and convert the low DC voltage to the select high DC voltage and thereafter immediately responsive to the voltage on the storage capacitor reaching the select high DC voltage level for disabling the converter from further operation so as to allow the select high DC voltage to gradually discharge from the storage capacitor, said control means being further responsive to the subsequent actuation of the camera to commence the photographic exposure cycle for reenabling the converter to again operate and convert the low DC voltage to the select high DC voltage and thereafter responsive to the voltage on the storage capacitor again reaching the select high DC voltage level for again disabling the converter from further operation so as to allow

the select high DC voltage to again gradually discharge from the storage capacitor during the remainder of the exposure cycle.

4,348,088

SINGLE LENS REFLEX CAMERA

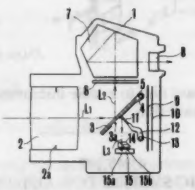
Masayoshi Yamamichi, Kawasaki, and Nobuo Tezuka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,969

Claims priority, application Japan, Jul. 10, 1979, 54-87115; Jul. 13, 1979, 54-89113; Jul. 13, 1979, 54-89116

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—152 **33 Claims**



1. A single lens reflex camera comprising:

(A) a viewfinder optical system adapted to observe an image to be formed on a film plane by an objective lens device;

(B) main movable reflection mirror means for directing an image forming light beam coming from said objective lens device to said viewfinder optical system, said main movable reflection mirror means being movable between a position so advanced into the optical path for exposure as to direct the image forming light beam coming from said objective lens device to said viewfinder optical system and a position so retracted to the outside of said optical path for exposure as to allow said film to be exposed to the image forming light beam coming from said objective lens device, and having a portion for passage at least a portion of the image forming light beam therethrough;

(C) auxiliary movable reflection mirror means for taking out the light passed through said light-passage allowing portion of said main movable reflection mirror means, said auxiliary movable reflection mirror means being arranged independently of said main movable reflection mirror means and movable between a position so advanced into said optical path for exposure behind said main movable reflection mirror means as to take out a light beam passage through said light-passage allowing portion of said main movable reflection mirror means and a position so retracted to the outside of said optical path for exposure as not to obstruct the exposure of said film to the image-forming light beam coming from said objective lens device;

(D) diaphragm controlling means for controlling diaphragm means equipped within said objective lens device for defining an exposure aperture opening from maximum possible aperture opening to a required aperture opening; and

(E) a single drive means common to said movable reflection mirror means, said auxiliary movable reflection mirror means and said diaphragm actuating means for moving said main movable reflection mirror means and said auxiliary movable reflection mirror means from their respective advanced positions to their respective retracted positions and for causing said diaphragm controlling means to control said diaphragm means equipped within said objective lens device, said drive means having a first controlling portion for said main movable reflection mirror means, a second controlling portion for said auxiliary movable reflection mirror means and a third controlling portion for said diaphragm controlling means.

4,348,089

LENS MOVEMENT ACTUATED REFERENCE AND SEQUENCING MEANS FOR CAMERAS HAVING UNIDIRECTIONAL AUTOMATIC FOCUSING

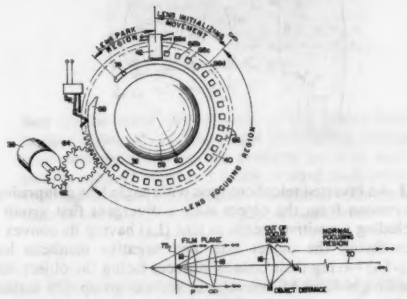
Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 865,852, Dec. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 729,289, Oct. 4, 1976, abandoned. This application Feb. 21, 1979, Ser. No. 13,681

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—195 **62 Claims**



1. A camera having an image plane and comprising:

means for selectively coupling said camera to a source of electrical energy;

a lens mounted for displacement over a given operational range wherein it alternately serves to focus images of subjects positioned in various locations within a normal range of selectable subject distances at said image plane, and also for displacement outside of its said given operational range into another range wherein it does not serve to focus images of subjects positioned within said normal selectable subject distance range at said image plane, said lens being normally located within its said other range when said camera is inoperative;

means for producing a signal indicative of the position of a particular subject, within said normal selectable subject distance range, selected to be photographed; and

drive means responsive to said signal for effecting the movement of said lens from its normally inoperative position within its said other range into its position within its said operational range wherein it serves to focus an image of the particular subject at said image plane to facilitate the recording of an image of the particular subject on film located at said image plane.

4,348,090

INVERTED GALILEAN FINDER

Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,218

Int. Cl.³ G03B *13/08*

U.S. Cl. 354—224 **5 Claims**

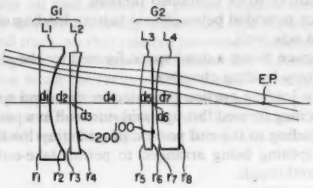
1. An inverted Galilean finder having a divergent objective lens and a convergent eyepiece, said objective lens including, in succession from the object side, a first negative lens and a second negative lens, said eyepiece including, in succession from the object side, a first positive lens and a second positive lens, said finder satisfying the following conditions:

$$1.2|F_1|<|f_1|<1.4|F_1|$$

$$4.4|F_1|<|f_2|<5.2|F_1|$$

$1.8 F_2 < f_3 < 2.2 F_2$

$1.8 F_2 < f_4 < 2.2 F_2$



where F_1 represents the focal length of said objective lens, F_2 the focal length of said eyepiece, f_1 the focal length of said first negative lens, f_2 the focal length of said second negative lens, f_3 the focal length of said first positive lens, and f_4 the focal length of said second positive lens.

4,348,091

INDICATOR DEVICE IN AN INVERTED GALILEAN FINDER

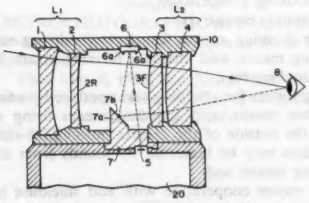
Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,469

Claims priority, application Japan, Jun. 3, 1980, 55-74538

Int. Cl.³ G03B *13/06, 17/20*

U.S. Cl. 354—225 **6 Claims**



1. In an inverted Galilean finder barrel having a divergent objective lens and a convergent eyepiece lens, an indicator device for effecting visual indication within an observation view field, said indicator device comprising:

(a) indicating means including indicating elements and disposed on the inner side surface of said barrel between said objective lens and said eyepiece lens;

(b) a first reflecting optical system having a reflecting surface capable of receiving the light beam from said indicating means and provided at a position opposed to said indicating means on the inner side surface of said barrel; and

(c) a second reflecting optical system having an obliquely disposed reflecting surface for reflecting toward said eyepiece lens the light beam from said indicating means reflected by said first reflecting optical system and disposed at a position opposed to the reflecting surface of said first reflecting optical system.

4,348,092

ELECTROMAGNETICALLY DRIVEN SHUTTER

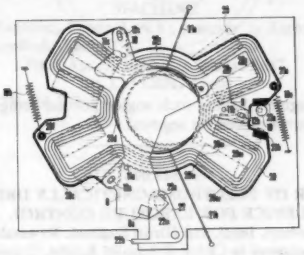
Michio Hirohata, Inagi, and Nobuo Tezuka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1981, Ser. No. 232,851

Claims priority, application Japan, Feb. 8, 1980, 55-15089; Feb. 8, 1980, 55-15091; Feb. 8, 1980, 55-15415[U]; Feb. 8, 1980, 55-15416[U]; Feb. 8, 1980, 55-15417[U]; Feb. 8, 1980, 55-15418[U]

Int. Cl.³ G03B *9/22*

U.S. Cl. 354—230 **6 Claims**



1. An electromagnetically driven shutter for a camera comprising:

a magnetic member adapted to form a magnetic circuit;

a permanent magnet for forming a magnetic circuit together with said magnetic member, said permanent magnet operating to produce a magnetic field;

a positioning member composed of nonmagnetic material and including a frame with a portion engageable with said permanent magnet;

a shutter driving rotor arranged in a space between said magnetic member and said positioning member, said space being formed by said frame of said positioning member;

an inductive coil arranged on said rotor in a pattern in the form of a sector, said coil when supplied with current operating to generate an electromagnetic force to drive said rotor in order to open said shutter, with part of the effective line elements of said coil entering and exiting a peripheral portion of said magnetic field with an obliquely slanted orientation to control said electromagnetic force; and

a spring exerting a force biasing said shutter to the closed position.

4,348,093

INTER-LENS SHUTTER

Edmund Haag, Technischer Angestellter, Talwiesenstrasse 26, 7546 Enzklosterle, Nonnenmiss, Fed. Rep. of Germany

Filed Aug. 20, 1981, Ser. No. 294,703

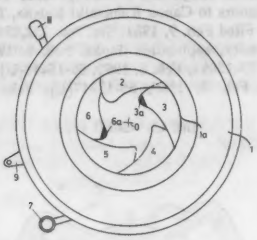
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032760

Int. Cl.³ G03B *9/22*

U.S. Cl. 354—233 **5 Claims**

1. Photograpic inter-lens shutter in which the opening and closure system is formed of a plurality of oscillating segments which are successively overlappingly arranged in ordinal sequence viewed in the direction of the optical axis and disposed for reciprocating backwards and forwards in a plane of movement between an open shutter position and a closed shutter position, and having outer ends which overlap in a closed position, in which two of the segments are provided as stabilizer segments having, on their outer ends which overlap in the closed position, a corresponding angled portion which extends substantially laterally to the plane of movement of the segments, the first stabilizer segment having such angled por-

tion being disposed after the frontmost successive segment viewed in the direction of the optical axis and the second



stabilizer segment having such angled portion being disposed after the fourth successive segment.

4,348,094

ROTOR OF ELECTROMAGNETICALLY DRIVEN DEVICE FOR EXPOSURE CONTROL

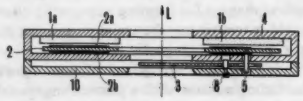
Michio Hirohata, Inagi, and Hirosi Sugitani, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1980, Ser. No. 183,858

Claims priority, application Japan, Sep. 3, 1979, 54-112643

Int. Cl.³ G03B *9/00*

U.S. Cl. 354—234 **7 Claims**



7. A method for making a rotor of an electromagnetically driven device for exposure comprising the steps of:

forming a base plate of epoxy resin;

forming a conductor member on both sides of the base plate by photo-etching;

forming a protective film of uv or pseudo uv ray-setting resin on both sides of the base plate by applying uv or pseudo uv to said resin adhered and set in planar form thereon;

polymerizing and setting said base plate by heating; and

setting the protective film between glass plates.

4,348,095

STRAP MOUNTING DEVICE

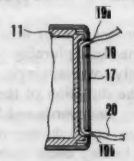
Toyotosi Suzuki, Tokyo, and Nobuhiro Ago, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,380

Claims priority, application Japan, Jun. 11, 1980, 55-81446

Int. Cl.³ G03B *17/02, 29/00*

U.S. Cl. 354—288 **4 Claims**



1. A portable instrument with a strap mounting device comprising:

a side wall defining part of said portable instrument;

a battery loading chamber provided aside said portable instrument,

said chamber having a shape corresponding to the shape of a battery to be contained therein;

a space provided between said battery loading chamber and said side wall,

said space being a dead space formed by the shape of said battery loading chamber;

a strap loading portion provided in said dead space; and

an opening formed through said side wall at a position corresponding to the end portion of said strap loading portion,

said opening being arranged to permit take-out of a strap therethrough.

4,348,096

SOUND MODE SELECTOR DEVICE IN A CAMERA INCORPORATING A BUZZER

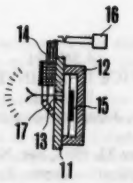
Makoto Katsuma, Yokohama; Kenichi Shinbori, Kawasaki; Masayoshi Kiuchi, Yokohama, and Kiyoshi Alyfuku, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1980, Ser. No. 204,194

Claims priority, application Japan, Nov. 9, 1979, 54-155620[U]

Int. Cl.³ G03B *17/18*

U.S. Cl. 354—289 **12 Claims**



1. A sound producing mode selector device for a camera having a housing, comprising:

sound forming means;

chamber forming means for accommodating said sound forming means, said chamber forming means having an apertured portion;

shielding means for shielding said apertured portion of said chamber means, said shielding means being accessible from the outside of the camera housing, so that at least two data may be indicated by sounds from said sound forming means; and

selector means cooperative with said shielding means for actuating a self-timer.

4,348,097

CAMERA POSITIONING APPARATUS

Charles Sippel, Villa Park, Ill., assignor to LogEtronics, Inc., Springfield, Va.

Filed Jul. 10, 1980, Ser. No. 167,595

Int. Cl.³ G03B *15/06*

U.S. Cl. 354—293 **10 Claims**

1. In picture taking apparatus,

(a) at least one element for varying the distance between a part of a camera and an object to be photographed,

(b) a track for supporting said element for movement to thus enable said distance to be varied,

(c) means for moving said element along said track to change the relative position of said part of the camera and the object to be photographed,

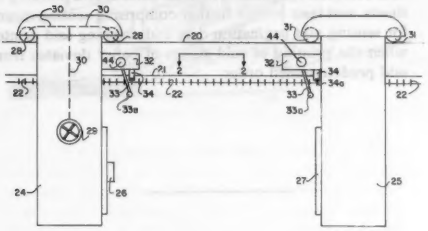
(d) incremental locating means mounted on said track for defining a series of locations along said track, and

(e) reciprocating means carried by said element for engaging

and disengaging said incremental locating means to position said reciprocating means in a selected one of said series of locations along said track,

the improvement comprising:

means, including carriage means, mounting said reciprocating means on said element to permit relative movement between said reciprocating means and said element parallel to said track, so that relative movement parallel to said track may occur between the element and the reciprocating means when the reciprocating means has engaged the incremental means and the element is moved parallel to the track and with respect to the incremental location means, said reciprocating means being mounted to reciprocate in said carriage means for engaging and disengaging said incremental locating means, and



a distance indicating gauge carried by said element in fixed relationship thereto and having an actuating projection extending therefrom for engaging said carriage means, so that when said element moves relative to said reciprocating means the amount of such movement will be indicated by said gauge,

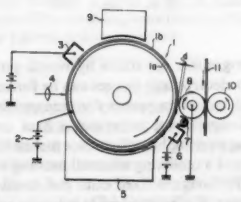
whereby the engagement of the reciprocating means with the incremental means achieves a relatively coarse position of said element and the reading of said gauge is a relatively fine indication of the position of the element with respect to one of said locations.

4,348,098

ELECTROPHOTOGRAPHIC APPARATUS

Yutaka Koizumi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,048
Claims priority, application Japan, May 7, 1979, 54/55427
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR **7 Claims**



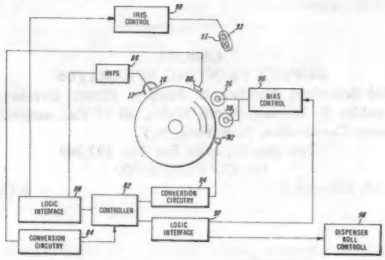
1. In an electrophotographic apparatus comprising a photosensitive member movable passed a plurality of processing stations to form an electrostatic latent image on said member and having means for developing said electrostatic latent image to form a toner image by contacting said latent image with a charged toner, the improvement including transfer means for transferring said toner image onto a record surface without physically contacting said photosensitive member, said transfer means including a conductive transfer roller disposed in closely spaced relation with said photosensitive member, means for making the potential difference between the toner of said toner image on said photosensitive member and said conductive transfer roller larger than the potential difference between said toner and said photosensitive surface by injecting charge into said toner whereby said toner image can be transferred to said conductive transfer roller as said photosensitive surface moves closely therepassed, and removing means for transferring the toner image on said conductive transfer roller to a record surface.

4,348,099

CLOSED LOOP CONTROL OF REPRODUCTION MACHINE

Louis J. Fantozzi, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 7, 1980, Ser. No. 137,667
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 E **20 Claims**



1. In a reproduction machine having a corona device for charging a photoreceptor, an illuminator for projecting an image of an object on a platen along an optical path onto the photoreceptor, a developer for applying toner to the photoreceptor, and a toner dispenser to provide toner to the developer, the method of optimizing machine operation using a sample data control system comprising the steps of:

disposing test targets into the optical path causing characteristics on the photoreceptor surface,

sensing the characteristics on the photoreceptor surface by the test targets,

analyzing the sensed signals to determine optimum processing conditions,

selectively regulating the corona device, the illuminator, the developer and the toner dispenser and

repeating the sequence at predetermined intervals.

4,348,100

CONTROL FOR XEROGRAPHIC SYSTEM

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

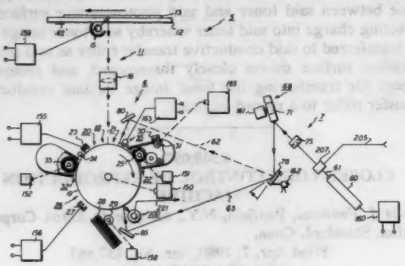
Filed Sep. 2, 1980, Ser. No. 183,133
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **6 Claims**

1. In a system having a xerographic section with xerographic processing components for producing and developing images on a charged photoreceptor for transfer to copy substrate material and a scanning section with scanning components to scan images on said photoreceptor to produce signals representative of the images scanned, said scanning section including thresholding means for processing image signals produced by scanning images on said photoreceptor and a source of threshold reference signals; the combination of:

(a) means for generating a test image for processing by said xerographic section and scanning by said scanning section;

(b) comparator means for comparing the signals produced by scanning said test image with said threshold reference

signals to provide threshold calibration signals for adjusting the threshold level of said thresholding means; and



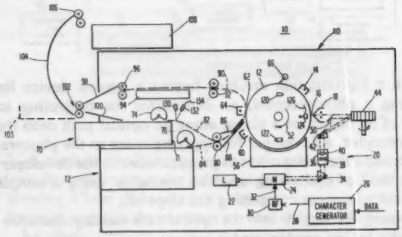
(c) control means for adjusting the threshold level of said thresholding means in response to said threshold calibration signals.

4,348,101

DUPLEX PRINTING APPARATUS

Arnold Schonfeld, Norristown; Jules A. Eibner, Dresher, and Franklin E. Bastian, North Wales, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,269
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **8 Claims**



1. A laser printer for printing data on both sides of a sheet of paper comprising:

a light source for transmitting a collimated light beam along a path;

a light beam modulator disposed along said light beam path for modulating said light beam in response to modulation signals received from a data source;

optical means disposed along said light beam path for exposing a photosensitive member to said modulated light beam to image data thereon;

at least one transfer means disposed adjacent said photosensitive member for transferring said data image to one side of a sheet of paper;

at least one paper feeding station for holding a plurality of sheets of paper, said at least one paper feeding station and said transfer means lying along a paper feeding path;

paper feeding means for feeding a sheet of paper from said at least one paper feeding station and presenting said sheet of paper to said transfer means whereby data is transferred to a single side of said sheet;

at least one discharge station for holding sheets of paper on which printing is finished, said discharge station and said transfer means lying along a paper discharge path; and

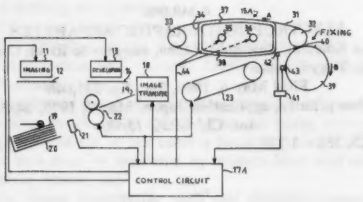
duplex means in close proximity to said at least one paper feeding station for discharging sheets of paper along a portion of said discharge path to said at least one discharge station when the printing on said sheets is furnished, and for depositing selected sheets of paper having data imaged on a first side and received from said transfer means into said at least one paper feeding station inverted from their original state in said paper feeding station, whereby said selected sheets are presented to said transfer means a second time for imaging of data on a second side of said selected sheets, said duplex means comprising a reversible propelling means for engaging and moving said sheets of paper, said reversible propelling means disposed intermediate said portion of said discharge path and said transfer means, wherein said laser printer prints data on first and second sides of a plurality of sheets of paper in a predetermined order by presenting each sheet of paper to a transfer means first and second times and wherein said data comprises pagination data for each of said plurality of sheets, said laser printer further comprising sensing means for sensing said pagination data and stopping said printer when the printing of said sheets of paper deviates from said predetermined order.

4,348,102

ELECTROGRAPHIC APPARATUS WITH CONTROL SYSTEM FOR FIXING POWDER IMAGES BY HEAT AND CONTACT

Bernardus W. L. M. Sessink, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Mar. 19, 1981, Ser. No. 246,134
Claims priority, application Netherlands, Apr. 9, 1980, 8002065
Int. Cl.³ G03G *15/00, 15/22*
U.S. Cl. 355—14 SH **4 Claims**



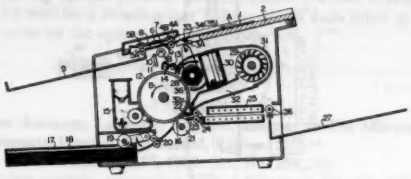
1. In an electrographic apparatus by which powder images corresponding to electrostatic images can be formed on receiving material, and including means for transporting receiving material to an image fixing zone and a heat contact fixing device comprising moving heated surface means for contacting a powder image and a receiving material moving into said zone so that the powder image is fixed onto the receiving material by heat and contact, the improvement wherein said apparatus is provided with a control system comprising first signalling means for issuing a first signal representing the heat capacity of a receiving material provided for receiving a powder image, second signalling means for issuing a second signal representing the heat content of said heated surface means, and means responsive the said first and second signals for controlling the quantity of receiving material transported per unit of time by said transporting means as a function of the heat content of said heated surface means and of the heat capacity of said receiving material.

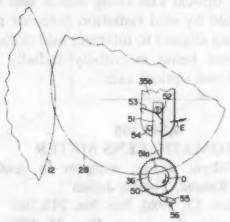
4,348,103

CLEANING APPARATUS FOR PHOTOSENSITIVE MEMBER OF ELECTROPHOTOGRAPHIC COPYING MACHINE

Hideyuki Kawazu, and Yoshiro Suzuki, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,920
Claims priority, application Japan, Jul. 14, 1980, 55-98927[U]
Int. Cl.³ G03G 21/00
U.S. Cl. 355—15 6 Claims





1. A cleaning apparatus for a photosensitive member of an electrophotographic machine, comprising

a cleaning brush disposed to be movable into contact with or away from a photosensitive member which is adapted to carry an electrostatic latent image thereon, the brush being disposed to be maintained in contact with said photosensitive member while rotating to remove therefrom unnecessary developing toner which attaches to the photosensitive member;

trap means for collecting unnecessary developing toner removed by the cleaning brush;

a striker rod disposed in abutment against the cleaning brush and to be rotatable for removing developing toner from the brush;

and drive means for causing an angular movement of the striker rod through a given angle in association with the movement of the cleaning brush into contact with or away from the photosensitive member.

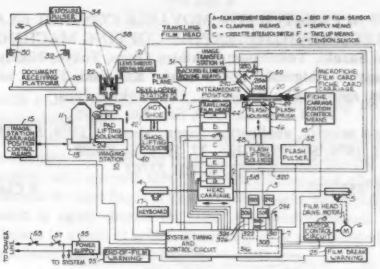
4,348,104

DOUBLE EXPOSURE CONTROL FOR MICROFICHE RECORDING SYSTEM

Herbert C. Ovshinsky, Oak Park, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 23, 1981, Ser. No. 227,941
Int. Cl.³ G03B 27/52
U.S. Cl. 355—41 19 Claims

1. In an annotatable photographic microfiche film recording system for forming and storing images of record copy, said system including means for forming a first image of said copy within a prescribed imaging area of an intermediate photographic film in which any portion of said imaging area can be imaged by radiant energy from said record copy to yield an image upon development in those regions of said imaging area illuminated by said radiant energy, means for replication of said first image as a second image on an annotatable microfiche photographic film by directing radiant energy from a frame illumination means through said imaging area of said intermediate film and onto said microfiche photographic film, said second image being an annotatable permanent record formed by the absorption of said radiant energy as it strikes said microfiche photographic film, said microfiche film having designated frames for receiving said second image at a prescribed location on said microfiche film card, said system further including means for adding an additional image to a previously exposed frame of said microfiche film, the improvement comprising means for exposing a given sensing area on said microfiche photographic film during said replication so that the status of said sensing area after said replication constitutes a permanent indication that the selected frame has been exposed, each of said frames having a unique corresponding sensing area associated therewith, each said corresponding sensing area being disposed so as not to substantially interfere with replica-



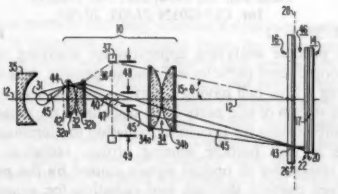
tion of said record copy, a status sensing means for sensing the status of the corresponding sensing area for a chosen frame before said replication, disabling control means responsive to said status sensing means for disabling said replication means when said status sensing means detects a status of said corresponding sensing area indicative of prior exposure of said chosen frame, means for detecting failure of said frame illumination means to expose said microfiche film comprising said frame illumination means for also exposing said corresponding sensing area by said frame illumination means during exposure, property sensing means for sensing during or after an attempted exposure by said frame illumination means a property of said corresponding sensing area indicative of exposure, failure alarm means for warning of said failure, and failure control means responsive to said property sensing means for activating said failure alarm means when the absence of said property is sensed during or after an attempted replication.

4,348,105

RADIATION SHADOW PROJECTION EXPOSURE SYSTEM

Fausto Caprari, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,362
Int. Cl.³ G03B 27/54
U.S. Cl. 355—67 10 Claims



1. In a radiation shadow projection exposure system of the type having a radiant source, an input lens to collect source

radiance as an effective source at a nodal point along the optical axis of the system, and an output lens to project the collected source radiance through a mask onto a proximate projected plane wherein the improvement comprises:

said source including means to provide spatially distributed partially coherent illumination of polychromatic radiance;

said input lens and said output lens comprising, respectively, a pair of plano-convex positive lens elements positioned along the optical axis to disperse the sorce radiance into a distributed effective source as a function of the wavelength of the radiance and to position the effective source in the space of the entrance pupil, said mask being positioned relative to the output lens so that the ray bundles at each wavelength of the radiance spectrum converge at the same vertex in the plane of the mask.

4,348,106

GUIDE APPARATUS FOR MOVABLE CONTACT GLASS IN ELECTROPHOTOGRAPHIC COPYING MACHINES

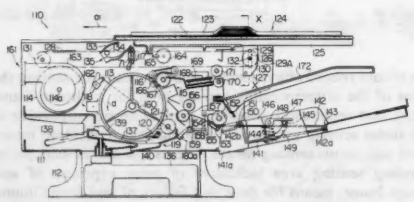
Shigeru Suzuki, Yokohama; Yukihiro Ohno, Tokyo; Nobuyuki Yanagawa, Chigasaki, and Yasunori Kawaishi, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,952

Claims priority, application Japan, May 18, 1979, 54-61922; May 31, 1979, 54-67921; Jun. 27, 1979, 54-81088

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **9 Claims**



1. A guide apparatus for guiding a movable contact glass, which serves as an original table in an electrophotographic copying machine, in an exposure scanning direction, in order to expose an original document stacking surface of the contact glass at a predetermined exposure position comprises:

a drive apparatus for reciprocating said contact glass in the exposure scanning direction; and

a guide member, which is shorter than the distance from said exposure position to the center of gravity of said contact glass at completion of the exposure scanning and whose upper surface at said exposure position is higher than the other upper surface thereof.

4,348,107

ORIFICE INSIDE OPTICAL ELEMENT

Robert C. Leif, Coral Gables, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jul. 18, 1980, Ser. No. 170,319

Int. Cl.³ G01N *21/05, 21/64*

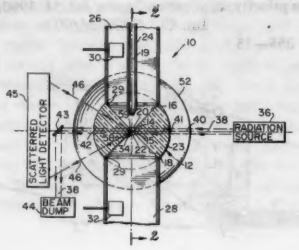
U.S. Cl. 356—72 **17 Claims**

1. A particle analyzing apparatus for studying individual microscopic sized particles in liquid suspension, said apparatus including a flow cell having a particle sensing orifice through which a stream of said particles in suspension are passed, radiation source means for providing radiation to illuminate a given particle in said particle sensing orifice, radiation detector means responsive to optical signals caused by the passage of said given particle through said radiation for generating an analog electrical signal, said flow cell having an upstream passageway and a downstream passageway formed in opposed ends of said flow cell, said particle sensing orifice being disposed in liquid connecting relationship between said passageways, the improvement being characterized by:

said flow cell comprising a substantially spherical element;

said spherical element having a monolithic structure;

a light illumination optical axis along which said radiation is



provided by said radiation source means and at least one light collecting optical axis along which said optical signals are collected by said radiation detector means, said optical axes being aligned to intersect said orifice, and said spherical element being essentially radially symmetric with respect to said optical axes.

4,348,108

AUTOMATIC LENS METER

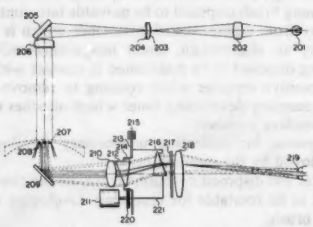
Osamu Shindow, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,704

Claims priority, application Japan, Dec. 24, 1979, 54-166835

Int. Cl.³ G01B *9/00*

U.S. Cl. 356—125 **1 Claim**



1. An automatic lens meter comprising:

means for causing parallel flux of light to enter a lens being inspected;

a multiple-pin-hole disc having at least three pin holes and disposed adjacent to a light-emission end of said lens being inspected on a first focal point of an objective lens or in the vicinity thereof;

a lens set consisting of said objective lens and a collector lens and adapted to collect light rays emitted from said multiple-pin-hole disc;

a photosensor for receiving respective pin-hole images of said multiple-pin-hole disc separately from each other in a position to be conjugate with said multiple-pin-hole disc with respect to said lens set; and

shading means for obtaining the coordinates of points at which respective light rays emitted from respective pin-holes cross a second plane including a second focal point of said objective lens, according to the shading time lag among respective light rays, characterized in that said shading means comprises:

a pair of deviated prisms respectively having substantially an equal apical angle, and disposed at a given spacing from

each other between said objective lens and said collector lens, with the apical angle of one prism directed opposite to that of the other vertically with respect to the optical axis;

a rotary mechanism for rotating said pair of deviated prisms about an optical axis of said lens set at a given rate;

means for reading an angle of rotation of said pair of deviated prisms; and

a shading disc disposed at the rear of said pair of deviated prisms on the second focal point of said objective lens, and having opaque portions and transparent portions defined by two lines crossing at a right angle to each other at a point on the optical axis of said lens set.

4,348,109
SIGHTS

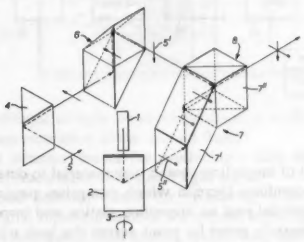
James Auterson, Leicester, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Oct. 17, 1980, Ser. No. 198,268

Claims priority, application United Kingdom, Oct. 19, 1979, 7936271

Int. Cl.³ G02B *23/10*

U.S. Cl. 356—252 **10 Claims**



1. A system comprising a sight into the field of which a position indicating mark in the form of a cross is required to be injected the means for generating said mark comprising a linear array of light sources, reflector means rotatable about an axis and arranged to reflect an image of said array in the course of rotation towards a first light transmissive member and thereafter towards a second light transmissive member such that said image scans across the field of each light transmissive member in turn, means for relatively rotating the image passing through one light transmissive member relative to the image passing through the other light transmissive members, means for optically combining the output of the two light transmissive members and means for selectively energising individual ones of said light sources whereby said optical combining means produces a mark consisting of two crossing strokes the first of which is derived from the image of an illuminated light source scanned across the field of said first light transmissive member and the other of which is derived from the image of a light source scanned across the field of said second light transmissive member.

4,348,110
CHARGING CURRENT INTEGRATING TYPE PHOTODETECTORS

Tetsuo Ito, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 118,908

Claims priority, application Japan, Mar. 3, 1979, 54/24951

Int. Cl.³ G01J *3/38, 1/46*

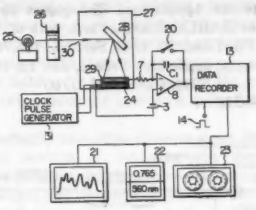
U.S. Cl. 356—328 **9 Claims**

1. A charging current integrating type photodetector comprising:

a photodiode;

a power source for applying a reverse bias to said photodiode and charging said photodiode until a charging current flowing to said photodiode becomes steady state;

a switching element connected in series with the photodiode to permit said charging current to flow to said photodiode when said switching element is turned on and to stop said charging current during a predetermined time in which said switching element is turned off to discharge said photodiode during said predetermined time in accordance



with a light intensity to be measured impinging on said photodiode; and

a current integrator disposed so that said switching element is coupled between said photodiode and said current integrator, said current integrator integrating said charging current at least from at time at which said switching element is again turned on after said predetermined time elapses to a time at which the charging of said photodiode is substantially completed.

4,348,111
OPTICAL PARTICLE ANALYZERS

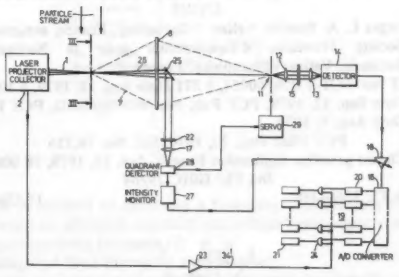
Apostolos Goulas, Cranfield; Brian R. Moon, Narborough, and Michael M. Ross, Lutterworth, all of England, assignors to The English Electric Company Limited, London, England

Filed Nov. 30, 1979, Ser. No. 98,852

Claims priority, application United Kingdom, Dec. 7, 1978, 47572/78

Int. Cl.³ G01N *15/02*

U.S. Cl. 356—336 **6 Claims**



1. An optical particle analyzer, wherein a stream of particles is subjected, in operation, to incident light, the arrangement including a first predetermined volume in said stream defined by a beam of light of a first frequency, a second predetermined volume in said stream defined by a beam of light of a second frequency, said second predetermined volume being smaller than said first volume and lying in a fixed position within it, means for recording a pulse of scattered light of said first frequency as one of said particles traverses said first predetermined volume, means for recording a pulse of scattered light of said second frequency as one of said particles traverses said second predetermined volume, validation means for selecting only those light pulses in respect of the first volume which are

in coincidence with light pulses in respect of the second volume, and assessment means for assessing a particle-size dependent factor of the selected light pulses.

4,348,112

METHOD OF AND APPARATUS FOR MEASURING THE VOLUME OF MATERIAL IN SUSPENSION IN A LIQUID

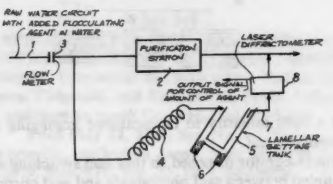
Henri Moreaud, Le Chesnay, and Jean-Paul Meric, Paris, both of France, assignors to Omnium d'Assainissement, Courbevoie and Societe des Applications Biologiques du Laser a l'Environnement (SABLE) S.a.r.l., Paris, both of, France

Filed Jan. 30, 1980, Ser. No. 116,766

Claims priority, application France, Jul. 13, 1979, 79 18188

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—338 **6 Claims**


RAW WATER CIRCUIT WITH ADDED FLOCCULATING AGENT IN WATER
PURIFICATION STATION
LASER DIFFRACTOMETER
FLOW METER
OUTPUT SIGNAL FOR CONTROL OF AMOUNT OF AGENT
LAMELLAR SETTLING TANK

2. An apparatus for automatically determining the quality of water which may contain materials in suspension, the apparatus comprising:

raw water and flocculating agent supply means upstream from a purification station;

at least one coagulation-settling system which includes a pipe coupled to said supply means and a settling tank in which flocs settle;

one laser diffractometer coupled to said coagulation-settling system to receive continuously settled water therefrom, said laser diffractometer including means for producing at least one signal representative of suspended materials remaining in the water.

4,348,113

PROCESS AND APPARATUS FOR ATTENUATING LINEARILY ERRORS IN A RING TYPE LASER RATE GYRO

Georges L. A. Bonfils, Velizy Villacoublay, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne, Velizy Villacoublay, France

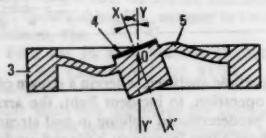
PCT No. PCT/FR78/00054, § 371 Date Sep. 12, 1979, § 102(e) Date Sep. 12, 1979, PCT Pub. No. WO79/00502, PCT Pub. Date Aug. 9, 1979

PCT Filed Dec. 22, 1978, Ser. No. 74,716

Claims priority, application France, Jan. 13, 1978, 78 00871

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **11 Claims**



1. Process for attenuating linearily errors in a ring type laser rate gyro that uses N mirrors arranged in such a way that two laser beams travel along two identical polygons in opposite directions, comprising the steps of angularly oscillating at least one of the mirrors that define the trajectories of the two laser beams with respect to the rate gyro body, about an axis perpendicular to a plane defined by said two laser beams; and arranging the rotational axis of each of the oscillating mirrors so as to be as close as possible to the perpendicular to the mirror being considered that passes through the point of contact of the laser beams with the mirror in question.

4,348,114

METHOD OF INSPECTING COATED WEB MATERIAL TO DETECT THE PRESENCE OF DOWNLINES THEREON

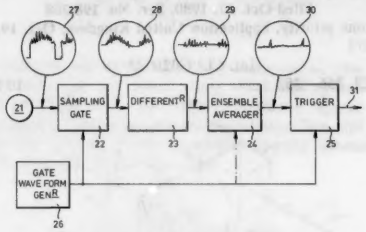
Denis M. Neale, Brentwood; Frederick J. Bontoft, Chelmsford, and John B. Ikin, Leigh-on-Sea, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 28, 1980, Ser. No. 211,159

Claims priority, application United Kingdom, Dec. 7, 1979, 7942268

Int. Cl.³ G01N *21/17*

U.S. Cl. 356—431 **7 Claims**



1. A method of inspecting coated web material to detect the presence of downlines thereon which comprises passing the coated web material past an inspection station and inspecting the web transversely point by point across the web width to produce data signals responsive to variations in coated thickness, performing said transverse inspection repeatedly as the web moves past said inspection station, summing those parts of successive data signals corresponding to a first pattern of at least 100 points spaced at like distances across the web width, thereby producing an averaged signal waveform, detecting as faults any abnormal excursions of the averaged signal waveform occurring within a predetermined time and thereafter repeating said summing and detecting in respect of at least a second pattern of similarly spaced-apart points intermediate the spaced-apart points of said first pattern.

4,348,115

CHROMATOGRAPHIC ANALYZER DETECTOR AND METHOD

Starnes E. Walker, Bartlesville, and Fred T. Klein, Tulsa, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1980, Ser. No. 121,763

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—436 **33 Claims**

1. An optical absorbance detector comprising:

radiation point source means for producing a point source of light;

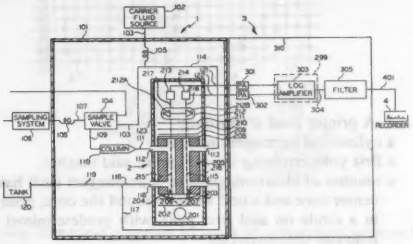
first spatial filter means optically aligned with the radiation point source means and operable for producing a first light beam and a second light beam, the first spatial filter means having an opaque portion thereof opaque to radiation from the radiation point source means, said opaque portion having a first through aperture and a second through aperture, the first through aperture and the second through aperture being optically aligned with the radiation point source means and the first through aperture allowing the first light beam to pass therethrough and the second through aperture allowing the second light beam

to pass therethrough, the first aperture and the second aperture being separated by at least a portion of the opaque portion of the first spatial filter means;

collimating means in light communication with the first spatial filter means for collimating the first light beam to produce a first collimated light beam and for collimating the second light beam to produce a second collimated light beam;

first flow cell means for passing a first fluid through a first fluid light path optically aligned with the first collimated light beam to produce a first light signal representative of the first fluid;

second flow cell means for passing a second fluid through a second fluid light path optically aligned with the second



collimated light beam to produce a second light signal representative of the second fluid;

first detector means for producing a first electrical signal representative of the first light signal;

second detector means for producing a second electrical signal representative of the second light signal; and

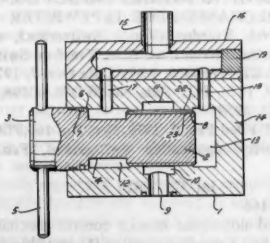
a second spatial filter means, said second spatial filter means positioned between the first and second flow cell means and the first and second detector means and having an opaque portion opaque to the radiation from the radiation point source, said opaque portion having a first aperture therethrough being optically aligned with the first light signal and with the first detector means and a second aperture being optically aligned with the second light signal and with the second detector means.

4,348,116

HOMOGENIZING APPARATUS

Andre Bordas, Fontenay aux Roses, France, assignor to Fives-Cail Babcock, Paris and Pierre Guerin S.A., Mauze-sur-le-Mignon, both of, France

Filed Oct. 30, 1980, Ser. No. 202,078
Claims priority, application France, Nov. 13, 1979, 79 27900
Int. Cl.³ B01F *3/08*
U.S. Cl. 366—340 **9 Claims**



1. An apparatus for homogenizing a liquid or pasty product, which comprises

(a) a casing having an internal cylindrical surface defining a first bore having an open end,

(1) a portion of the internal cylindrical surface being threaded and

(2) the casing defining an inlet port terminating in an annular chamber substantially centered between the ends of the threaded portion,

(b) a rotatable closing plug in the open bore end, the plug having

(1) a cylindrical threaded portion meshing with the threaded portion of the internal cylindrical surface the threads of the internal cylindrical surface of the casing being truncated in transverse section in a progressively variable fashion by a second bore of the casing having an axis offset from the geometric axis of the first bore, and

(2) longitudinally extending grooves along the cylindrical threaded portion of the plug, the threads of the threaded portions and the grooves defining homogenizing passages, and the annular chamber surrounding the threaded portion of the plug and communicating with the homogenizing passages whereby a liquid or pasty product delivered under pressure into the inlet port is divided into two equal streams flowing from the centered annular chamber through the homogenizing passages in opposite directions and the variation of the section of the homogenizing passages is controlled by the rotation of the plug in relation to the casing, and

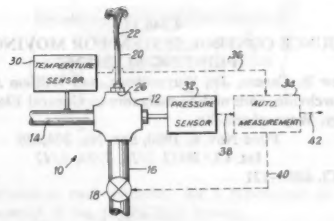
(c) an outlet conduit receiving the streams of homogenized liquid or pasty product.

4,348,117

APPARATUS AND METHOD FOR MEASURING BOILING OR FLASH PRESSURE OF PRESSURIZED FLUID

Donald Michels, Whittier, Calif., assignor to Republic Geothermal, Santa Fe, Calif.

Filed Mar. 12, 1980, Ser. No. 129,574
Int. Cl.³ G01N *25/08, 7/14*
U.S. Cl. 374—24 **15 Claims**



12. A method of detecting a boundary pressure in a fluid between an all-liquid condition and a liquid-plus-vapor condition, comprising the steps of:

passing said fluid through a test chamber;

varying the pressure of said fluid in said test chamber through said boundary pressure;

venting an upper portion of said test chamber to atmospheric pressure whereby only liquid is vented when said pressure is above said boundary pressure and liquid plus vapor is vented when said pressure is below said boundary pressure; and

determining said boundary pressure in response to a change in a characteristic of said venting.

15. Apparatus for detecting a boundary pressure in a fluid between an all-liquid condition and a liquid-plus-vapor condition comprising:

a test chamber;

means for passing said fluid through said test chamber;

means for controlling pressure of said fluid in said test chamber; and

means in said test chamber effective to vent said liquid from said test chamber, and to vent liquid plus vapor when said fluid is in said liquid-plus-vapor condition.

4,348,118

PAPER TRANSPORT MEANS FOR A RECORDING DEVICE

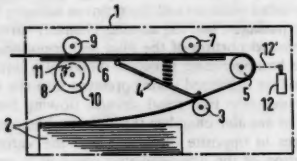
Bengt Skafvenstedt, Stockholm, and Sture Ahlgren, Vällingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 245,915

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3014043

Int. Cl.³ B41J *29/38*

U.S. Cl. 400—54 **6 Claims**



1. A paper transport system for a recording device with a receiving location for the unwritten recording paper and at least one motor-driven drive capstan having a motor for driving the same for the transport of the paper from the receiving location, a recording location at which a fluid jet writer is disposed for writing, characterized in that the motor-driven drive capstan (8) has a no-load indicator (13 through 19, 22, 23) allocated to it which identifies a no-load operation of the drive capstan (8) and generates a shut-down signal for the fluid jet writer (12).

4,348,119

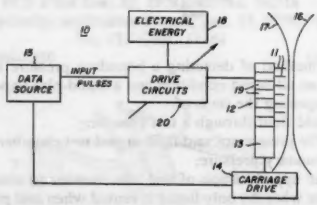
BOUNCE CONTROL SYSTEM FOR MOVING COIL PRINTING ELEMENT

Andrew B. Carson, Jr., Waynesboro, and William A. Hanger, Churchville, both of Va., assignors to General Electric Company, Waynesboro, Va.

Filed Nov. 6, 1980, Ser. No. 204,628

Int. Cl.³ B41J *3/10, 7/84, 9/42*

U.S. Cl. 400—121 **14 Claims**



1. In an impact printer which develops a force whose direction is a function of the direction of the driving current, said printer comprising a movable electromagnetic printing element located adjacent a backstop and a source of drive pulses for moving the printing element from the backstop toward a record medium to print indicia, damping means coupled to the printing element and responsive to impact of the printing element on the backstop for applying to said printing element a damping pulse after impact theref on the backstop to oppose the rebound of the printing element from the backstop.

4,348,120

PRINTING HEAD FOR A DOT PRINTER

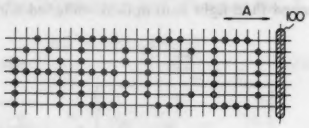
Minoru Isobe; Hiroshi Kikuchi; Minoru Teshima, all of Tokyo; Tadasi Kodama, Sakura, and Wataru Ohara, Yokosuka, all of Japan, assignors to Oki Electric Industry Co. Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,106

Claims priority, application Japan, May 11, 1979, 54-56924; May 11, 1979, 54-56925; May 22, 1979, 54-62143

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **3 Claims**



1. A printer head comprising:

a cylindrical permanent magnet,

a first yoke covering the bottom of said magnet,

n number of electromagnets (n is an integer) each having a center core and a coil wound around the core, positioned in a circle on said first yoke with predetermined angle intervals therebetween,

a disk shaped spring having an outer ring and n number of projections projecting towards the center of said outer ring,

n number of elongated armatures each having first portion of predetermined shape and a tapered end portion wherein each of said armatures is positioned on one of the projections of said disk spring,

n number of print needles each fixed to one of said armatures perpendicular to the plane of the disk spring wherein each of said needles is straight,

a ring shaped spacer positioned between said disk spring and said cylindrical permanent magnet,

a second circular yoke fixed on said disk spring for providing a magnetic flux path between the permanent magnet and each of said electromagnets, said second circular yoke having radial slits having a shape corresponding to said predetermined shape for receiving said armatures wherein the tapered end portions of said armatures extend from said slits at the center of said yoke and wherein the thickness of the radial slits is equal to the thickness of said armatures, and

a guideframe having a thin linear slit for receiving the tops of said print needles wherein said guideframe covers the print needles.

4,348,121

STRIKE AND NON-STRIKE IMPACT CONTROL MECHANISM FOR TYPEWRITER

Raymond Clavel, Yverdon (Vaud), Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

PCT No. PCT/CH79/00016, § 371 Date Oct. 7, 1979, § 102(e) Date Jul. 19, 1979, PCT Pub. No. WO79/00598, PCT Pub. Date Aug. 23, 1979

PCT Filed Feb. 6, 1979, Ser. No. 166,978

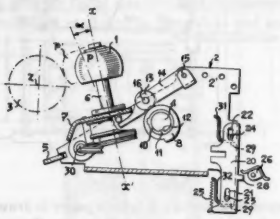
Claims priority, application Switzerland, Feb. 7, 1978, 1325/78

Int. Cl.³ B41J *1/32*

U.S. Cl. 400—166 **6 Claims**

1. Strike and non-strike impact control mechanism for a typewriter having a printing element (1) movable parallel to a platen (3) upon a carrier (2), said mechanism comprising particularly a drive shaft (4), at least two rotatable cams (8 and 9) integral with the drive shaft and corresponding to different strike forces, a guidance component (17 and 18) for guiding a

tracker (13) of the radial contour of said cams (8 and 9), and capable of displacing said tracker so as to cause said tracker to work in connection with one or the other or neither of said cams, means (14-17) for transmission of the movement of said tracker (13) to said printing element (1) to assure particularly the striking of a character, and means (20,40 and 41) for receiving command impulses given by universal bars (26,42 and 43) arranged parallel to said platen (3), characterized in that said control mechanism comprises abutment apparatus (34-38) for abutting said guidance component (17 and 18) of said tracker (13) in several positions, the activation of said apparatus being controlled by said means (20,40 and 41) for receiving command impulses, a tension spring (39) acting upon said guidance component (17 and 18) of said tracker (13) to cause said means for



receiving command impulses to work in connection with said abutment apparatus, a return apparatus (61 and 59) for return of said guidance component into a normal position, said return apparatus being driven by said drive shaft (4) upon each complete rotation of said drive shaft, said means for receiving command impluses comprising first, second and third intermediate couplers (20,40 and 41), said abutment apparatus comprising a key (38), the position of which is controlled by said second and third intermediate couplers (40 and 41) for receiving command impulses, and by an extremity (37) of a lever (34) driven by said guidance component (17 and 18) of said tracker (13), and set up so as to work in connection with said key (38) in several positions corresponding to the choice of strike or non-strike force.

4,348,122

SHIFT LOCK AND POSITION INDICATING TORSION SPRING ACTIVATED KEY SWITCH

Justin O. Balta, 5638 Atlle, Jacksonville, Fla. 33205, and Edward I. Nelson, 10430 NW. 24th St., Sunrise, Fla. 33322

Filed Oct. 23, 1980, Ser. No. 200,254
Int. Cl.³ B41J 5/20
U.S. Cl. 400—276 **7 Claims**

1. A shift lock mechanism for photo-optical switch apparatus comprising,

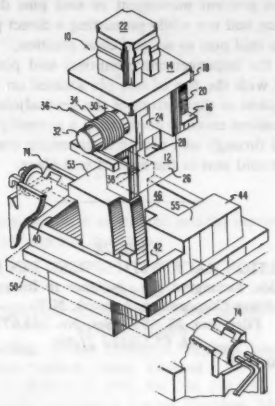
an insert member including means for snap-in insertion of said member in a respective aperture in a keyboard array of apertures,

a slidable shutter member including an aperture therein, said shutter member being vertically, slidably movable in said insert member effective in one position to block light from a light generator to a light receptor and in another position to permit light to pass unobstructed from said light generator to said light receptor,

said shutter member further including an external, horizontally disposed, biasing member for biasing said shutter member vertically upwardly into a light blocking position within said insert member,

an externally supported demountable, removable cam member slidably horizontally received on said shutter member in diametric opposition to said horizontally disposed biasing member and including means for demountably, receiving and guiding a cam follower member therein, and

a cam follower member loosely slidably mounted on said insert member with one end inserted in said insert member and axially aligned with said horizontally disposed biasing member, the opposite end of said follower member engaging said demountable cam member effective in one posi-



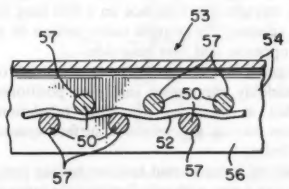
tion to lock said shutter member in a light passing position and in another position to block the light from said light generating member.

4,348,123

TABULATION RACK WITH SPRING PIN HOLDING

Clinton E. Abbott, Nicholasville, and Larry J. Rice, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,676
Int. Cl.³ B41J 21/04
U.S. Cl. 400—298 **3 Claims**



1. A tabulation rack assembly for a typewriter or other stepping printer of the general type having:

a plurality of pins, each of said pins having a first, substantially straight outer surface on a first long side and a second, substantially straight outer surface on a second long side opposite said first long side,

an elongated bracket having pairs of spaced, opposed holes for slideably supporting said pins positioned along said bracket at locations providing tabulation stops;

said pairs of holes in said bracket having received in them one of said pins with said first straight outer surface facing the side of said holes;

said holes being larger than the dimensions of the pin received so that the pin may move longitudinally to set and clear positions by sliding within the holes while remaining received within said pair of holes; and

at least one continuous, resilient member extending in contract with a plurality of said pins received in said pairs of holes, said contact being with said second straight outer surface of each of said pins contacted,

said resilient member being in a deformed configuration;

said resilience of said member in said deformed configura-

tion being sufficient to press said first straight outer surfaces of all of said pins received in said pairs of holes against the side of said holes to create sufficient frictional drag to prevent movement of said pins during normal handling and use while permitting a direct pushing force to slide said pins to set and clear position,

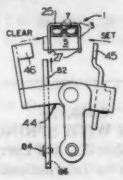
wherein the improvement comprises said pins being positioned with the top of one pin located on generally the same plane as the bottom of the next adjoining pins, and said resilient member comprising a normally straight wire wound through said pins in a serpentine configuration to engage said pins in the area of said plane.

4,348,124

TABULATION RACK WITH SPRING PIN HOLDING

Larry J. Rice, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,677
Int. Cl.³ B41J *21/04*
U.S. Cl. 400—298 **4 Claims**



1. A tabulation rack assembly for a typewriter or other stepping printer comprising:

a plurality of pins, each of said pins having a first, substantially straight outer surface on a first long side and a second, substantially straight outer surface on a second long side opposite said first long side,

an elongated bracket having pairs of spaced, opposed holes for slidably supporting said pins positioned along said bracket at locations providing tabulation stops, said bracket having a continuous surface spaced away from said holes;

said pairs of holes in said bracket having received in them one of said pins with said first straight outer surface facing the side of said holes;

said holes being larger than the dimensions of the pin received so that the pin may move longitudinally to set and clear positions by sliding within the holes while remaining received within said pair of holes; and

at least two continuous, resilient members extending in contact with a plurality of said pins received in said pairs of holes, said contact being with said second straight outer surface of each of said pins contacted,

said resilient members being in a deformed configuration, said resilient members comprising two coil springs of mechanical spring wire deformed by the coils being partially pushed in one direction along the center axis of each said coil spring, the diameter of the coils being so large that said coils remain deformed in the area between said pins and said continuous surface of said bracket;

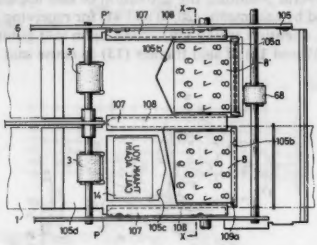
said resilience of said members in said deformed configuration being sufficient to press said first straight outer surfaces of all of said pins received in said pairs of holes against the side of said holes to create sufficient frictional drag to prevent movement of said pins during normal handling and use while permitting a direct pushing force to slide said pins to set and clear positions.

4,348,125

PAPER GUIDE MECHANISM OF PRINTER

Toshimasa Fujiwara, Ayasemachi, and Yoshiyuki Sudo, Yono, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Aug. 8, 1980, Ser. No. 176,378
Claims priority, application Japan, Oct. 8, 1979, 54-110130[U]
Int. Cl.³ B41J *15/18, 15/04*
U.S. Cl. 400—645.1 **7 Claims**



1. In a paper tape printer in which paper is drawn from a roll of paper and advanced along a feed run through a printing station:

a main body;

a first guide member including a first guide plate provided with a first opening and located in said main body and extending along and below said feed run;

a first printing section registering with said first opening:

a mount swingably supported by said main body and including a second guide member having a second plate provided with a second opening and being movable between an advanced position with said second guide plate extending along and parallel to and above and proximate said first guide plate with said second opening registering with said first opening and delineating with said first guide plate a passageway for said paper along said feed run, and a retracted position remote from said run to open said passageway and provide access to said paper along said feed run;

a second printing section supported by and movable with said mount and registering with said second opening; and

transversely spaced lip members disposed above and extending along the side edges of said first guide plate and directed toward each other and overlying only the side borders of said paper extending along said passageway and positioned between said first and second guide members to releasably restrict the vertical movement of said paper side borders when said mount is in its retracted position.

4,348,126

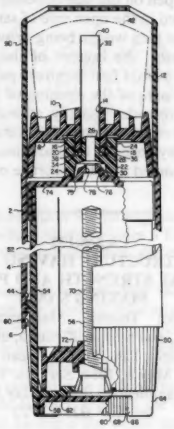
BRUSH ASSEMBLY

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 13, 1980, Ser. No. 206,520
Int. Cl.³ A46B *11/02, 17/04*
U.S. Cl. 401—135 **2 Claims**

1. A brush assembly comprising a brush portion and a cartridge portion, said brush portion comprising an elongated housing open at a first end thereof, a bristle-retaining wall at a second end thereof, said wall having an opening extending therethrough, a collar disposed about said opening and extending from an interior surface of said wall toward said first end, a retainer ring of elastomeric material fixed to said collar, said retainer ring having an annular wall defining in part an annular recess, said collar being disposed in said recess, said retainer ring having a central tubular portion defining in part said annular recess and extending into said opening, a flexible sleeve

disposed in said opening, a first end of said sleeve being open and having a circular base portion, said base portion being clamped between said retainer ring and said collar, a second end of said sleeve being disposed in a body of bristles, said housing having therein first connecting means comprising internal threads on a wall portion of said brush portion housing for releasably connecting said brush portion to said cartridge portion, said cartridge portion comprising a cartridge housing adapted to be inserted in said brush portion by way of said open first end of said brush portion, said cartridge housing defining a chamber adapted to retain a fluid, a spindle extending through a first end of said cartridge housing, manual turning means fixed to said spindle and disposed on an exterior surface of said first cartridge end, said manual turning means comprising a circular knob, and including an interrupted skirt depending from said cartridge housing first end and disposed



around said knob, the interruptions in said skirt defining openings for manual access to the periphery of said knob, said spindle having a threaded portion, a piston threadedly disposed on said spindle and adapted, upon rotation of said spindle, to move in said chamber toward a second end of said cartridge housing, an exterior side of said cartridge housing second end having a shoulder portion adapted to engage said retainer ring annular wall to effect a seal between said brush portion and said cartridge portion, a closed nozzle extending from said cartridge housing second end and adapted to be opened to provide an orifice at the end thereof and to be received in a pocket formed by said annular wall, said nozzle being adapted to be aligned with said tubular portion, and second connecting means comprising external threads on a wall portion of said cartridge portion for releasable connection to said first connecting means.

4,348,127

CONNECTOR FOR EXTRUDED SECTIONS SUCH AS PICTURE FRAME MEMBERS

George O. Hays, Jr., P.O. Box 355, Summerville, S.C. 29483

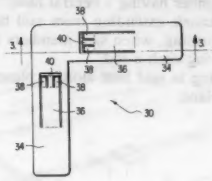
Filed Jul. 24, 1981, Ser. No. 287,096

Int. Cl.³ G09F *1/12*; A47G *1/10*

U.S. Cl. 403—9 **4 Claims**

2. The improvement in a connector for joining extruded metal sections each having an open-sided slot of T-shape configuration, said connector comprising:

a spring steel member having first and second leg portions extending from a common juncture and slideable into said slot, each leg having a tab formed therein, said tab extending along the principal axis of the leg, having its free end toward said juncture of said legs, and terminating in three tines, said tab being bent at a small angle relative to the plane of said legs, the two lateral tines being bent further



in the same direction as said tab and the center tine being bent in the opposite direction.

4,348,128

CONNECTOR ASSEMBLY FOR SCAFFOLD STRUCTURES

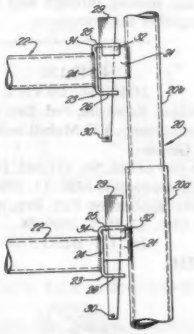
Peter E. Gostling, Sutton Coldfield, England, assignor to C. Evans & Sons Limited, Essex, England

Filed Mar. 3, 1980, Ser. No. 126,707

Claims priority, application United Kingdom, Mar. 8, 1979, 7908234; Sep. 12, 1979, 791622

Int. Cl.³ E04G *7/00*; F16B *1/00*

U.S. Cl. 403—49 **8 Claims**



1. A connector assembly for use in builders scaffolding of the kind hereinbefore described, comprising an open-ended socket adapted to be fixed to an upright member or standard with the open ends thereof in parallel alignment with the longitudinal axis of the upright member, a channel-shaped connector member having a base flange and upper and lower arms and adapted to be fixed by its base flange to an end of a cross member and, in use, to be positioned with its arms at opposite ends of the socket, and a wedge element provided to extend through openings in the respective arms of the connector member, and through the socket wherein, in the fully interconnected position of the assembly, the base flange of the connector member is in tight engagement with the outer surface of the socket and the ends of the arms of the connector member are in spaced relationship with the outer peripheral surface of the upright member.

4,348,129

COUPLING JOINT

Maurizio Conforti, Via Bietoletti 21, Sesto Fiorentino (FI), Italy

Filed Apr. 16, 1979, Ser. No. 30,168

Claims priority, application Italy, Apr. 14, 1978, 9416 A/78

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—218 **5 Claims**

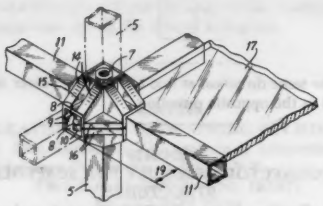
1. A six-way joint for assembling a plurality of tubular rods

in three orthogonal and concurrent directions, comprising, combination:

two separable, complementary, shell-shaped members, each member having a central base;

four channels extending from said base along a first plane and forming, when said members are assembled, sockets receiving each a rod;

an opening in said base along a plane perpendicular to said first plane;



a peg in said opening, said peg having a bore therethrough, said peg being adapted for connection to the end of a rod;

seats extending outwardly from said base parallel to said channels but on different planes;

horizontal gussets between said seats and coplanar with said base, and

fastening means passing through said bore in said peg for securing together said members.

4,348,130

JOINING DEVICE

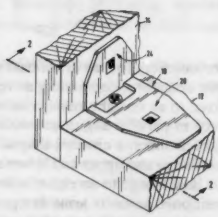
Karl Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager, KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 974,042, Dec. 28, 1978, Pat. No. 4,272,207. This application Mar. 11, 1980, Ser. No. 129,264

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836678; Mar. 12, 1979, 2909656

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—231 **15 Claims**



1. A joining device for joining first and second boardlike furniture parts meeting at an angle, preferably at right angles, with respect to each other, comprising: first and second fittings adapted to be mounted fixedly into first and second mortises respectively in said first and second furniture parts, said first fitting comprising a turn wedge with a spiral-shaped locking wedge which is mounted in said first fitting for turning out of a starting position in which it is turned back into said first fitting, into a locking position in which it emerges from said first furniture part, said second fitting having in its surface facing said first fitting, an elongated undercut recess into which the locking wedge can engage, said first and second fittings being in the form of substantially cylindrical, plastic drive-in cups adapted to be inserted into said first and second mortises respectively, said first and second mortises having orifices on one side face of said first and second furniture parts respectively, said first mortise being broken-through to an edge of said first furniture part for the passage of said turn wedge, and said first fitting having a flattened portion at its side associated with said break-through such that the flattened portion open for the passage of the turn wedge is approximately flush with said edge when in its proper position of assembly, said locking wedge being formed by a marginal molding projecting in opposite directions over more then 180° from the marginal portion of a disk-like base part provided with pivots for mounting in said first fitting, said marginal molding having surfaces on opposite sides of said base part, which surfaces extend spiral-like and face said pivots and engage behind inner surfaces of two locking abutments projecting from opposite lateral surfaces of said elongated recess in said second fitting, said first fitting being composed of a cup having a bottom and integral therewith a circumferential wall which is cylindrical with the exception of said flattened portion and which is open on the side opposite to said bottom, and an obturator inserted in the open side of said cup, and bearings for the pivots of the turn wedge being provided in said bottom and in said obturator, the bottom of the cup being located within the mortise of said first furniture part, whereas a cover part located in the area of the opening of the mortise is made from metal and protrudes radially at least in a partial area thereof beyond the outer surface of the circumferential wall of the cup and thereby forms a base abutment when the cup is pressed into or pounded into the mortise of said first furniture part.

4,348,131

WELDED STRUCTURE HAVING IMPROVED MECHANICAL STRENGTH AND PROCESS FOR MAKING SAME

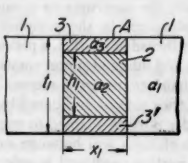
Shizuka Shimanuki; Toshimi Matsumoto; Hiroshi Sato; Tsutomu Onuma, and Seishin Kirihara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,329

Claims priority, application Japan, May 9, 1979, 54-55759

Int. Cl.³ B23K *9/23*

U.S. Cl. 403—272 **12 Claims**



1. A welded structure with compressive stress on the surface of its weld produced by stress relief annealing treatment, comprising:

structural members welded by at least one weld joint into said welded structure and thereafter annealed;

a plurality of weld metals deposited on said structural members in a zone defining said weld joint of said welded structure in such a manner that the weld metals are restrained by the structural members;

said plurality of weld metals comprising a first weld metal having a first coefficient of thermal expansion forming at least one layer and a second weld metal having a second coefficient of thermal expansion higher than said first coefficient of thermal expansion forming at least a second layer, said first weld metal and said second weld metal being contiguous to each other and fused into the welded portion of said welded structure to provide a metallurgical bond, the layer of said first weld metal having an exposed surface;

said coefficient of thermal expansion of said first weld metal layer being lower than that of said second weld metal layer by over 1×10^{-6}/°C.; and

the ratio of the thickness, as measured perpendicular to said surface, of said second weld metal to the thickness of said weld joint and the difference between said first and second coefficient of thermal expansion being sufficient that said exposed surface has compressive stress after annealing.

4,348,132

CLAMPING CONNECTION FOR JOINING AN EXTERNAL STRUCTURAL PART WITH A SHAFT

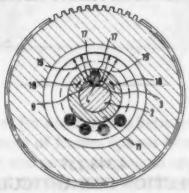
Ralph Mullenberg, Im Wiesengrund 6, 4048 Grevenbroich 12, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,485

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930245

Int. Cl.³ B25G *3/28;* F16B *3/00, 7/00*

U.S. Cl. 403—356 **5 Claims**



1. A clamping connection for joining an external structural part with a shaft, which shaft includes a longitudinal keyway therein defined by flanks in the shaft, the connection comprising:

a conical clamping set surrounding said shaft and being engageable with the external structural part, said conical clamping set including a plurality of co-operating conical rings for generating, under the action of a tightening operation, radial clamping forces upon axial displacement of at least one conical ring in relation to another;

an element which directly engages the shaft, said shaft engaging element having a slit which extends both radially and longitudinally therein, said slit being at least partially defined by flanks in said shaft engaging element, said shaft engaging element receiving radial forces generated by the clamping set, there being a certain region in which said longitudinal slit and part of said clamping set are closely mutually disposed;

a key fitted into said longitudinal keyway in the shaft and tightly abutting the flanks in the shaft prior to tightening of the conical ring, said key entering said longitudinal slit in at least said certain region thereof;

said longitudinal slit in said shaft engaging element and said key being mutually so dimensioned as to effect forcible abutment of said longitudinal slit, via its flanks, against said key prior to complete tightening of said clamping set, yet after initiation of tightening thereof and to effect further tightening of the abutment of the flanks of the keyway with said key during tightening of said conical clamping set, such further tightening being effected by a radially inward force exerted by said shaft engaging element on the shaft in the region of the keyway thereof during tightening of the clamping set.

4,348,133

MEDIAN BARRIER CONSTRUCTION

Peter F. Trent, Westmount, and Raymond Charlebois, Laval sur-le-Lac, both of Canada, assignors to Plastibeton Canada Inc., Canada

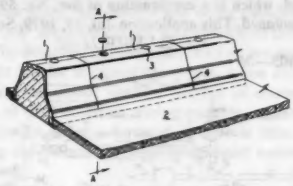
Filed Jun. 2, 1980, Ser. No. 155,596

Claims priority, application Canada, Apr. 25, 1980, 350738

Int. Cl.³ E01F *13/00, 15/00;* E01C *11/22*

U.S. Cl. 404—6 **12 Claims**

1. A structural member comprising an elongated, relatively thin outer U-shaped shell member open at one end between the legs thereof integrally pre-formed of polymer concrete, and having an outer surface defining a desired outer peripheral shape of a median barrier for highway construction, and having spaced apart openings in the top of the shell member, the



shell member being adapted for end-to-end arrangement with other shell members along a road subsurface to form an interior space therebeneath for receiving filler material which does not adhere to the polymer concrete shell members.

4,348,134

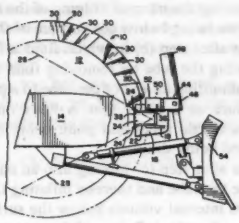
SCRAPER ASSEMBLY FOR A PADFOOT COMPACTOR, AND METHOD OF FORMING SAME

Robert F. Goehler, Greencastle, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 24, 1980, Ser. No. 114,964

Int. Cl.³ E01C *19/26;* A01B *29/04, 29/06*

U.S. Cl. 404—129 **11 Claims**



1. A scraper assembly, for a padfoot-type earth compactor, comprising:

a pair of substantially flat, elongate elements;

each of said elements having a longitudinal edge with an undulated configuration defined by a series of spaced-apart recesses with intervening, prominently-extending tongues; and

means fixing said elements in a spaced-apart, superposed and substantially parallel relationship, with said longitudinal edges, recesses, and tongues in common alignment; wherein

said elements each have a planar portion subsisting in a given plane;

said tongues of each element are angularly disposed relative to said planar portions;

said fixing means comprises wall means interposed between, and fixed to, said tongues of said elements, to secure said tongues to said common alignment;

said wall means comprises means for securing said tongues in said common alignment and for maintaining said tongues in said angular disposition with a divergent angle therebetween;

said wall means comprises gussets; and

each of said gussets having a portion of one uniform width and a portion of greater width than said one width; and

said gusset portion of one width is fixed to said planar portions of said elements, and said gusset portion of greater width is fixed to said tongues to maintain said divergent angle therebetween.

4,348,135

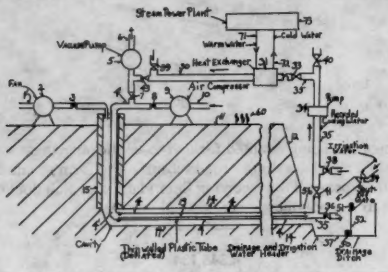
DRAINING, IRRIGATING AND AERATION OF SOIL AND HEATING OR COOLING OF SOIL

John C. St. Clair, Box 3345, Columbus, Ohio 43210

Continuation-in-part of Ser. No. 738,182, Nov. 2, 1976, abandoned, which is a continuation of Ser. No. 593,022, Jul. 3, 1975, abandoned. This application Jul. 23, 1979, Ser. No. 60,214

Int. Cl.³ E02B *11/02*

U.S. Cl. 405—36 8 Claims



1. A method for draining land which comprises:

(a) burying a flexible tube in a substantially horizontal position beneath the surface of the ground,

(b) then after the tube is placed below the surface of the ground forcing fluid into an end of the tube and thereby increasing the internal volume of the tube, said increase in volume being below the surface of the ground,

(c) then after step (b) in which fluid is forced into the tube, deflating the tube by removing fluid from inside the tube by submitting an end of the tube to a pressure less than the pressure at a point that is both outside the tube and contacts said tube, said point being under the surface of ground being drained,

(d) then after step (c) forcing into an end of the tube a fluid inside the tube and thereby inflating the tube and increasing its internal volume below the surface of the ground,

(e) then after the inflation of the tube removing fluid from the tube so the volume, the tube occupies, decreases in volume and there is left because of this decrease in volume a cavity around the tube that is open the length of the tube and to an outlet at the end of the tube, that is open for water to drain out of,

(f) after the mentioned inflation and deflation in steps (d) and (e), draining water through the cavity around the tube to the outlet at the end of the tube and out of the cavity to the outlet,

(g) after the preceding steps, and after the rate of drainage from the cavity has decreased after rains, repeating both the inflation and deflation steps so as to increase the rate of drainage from the cavity after rains.

4,348,136

SPILL OIL CONTAINMENT SYSTEM

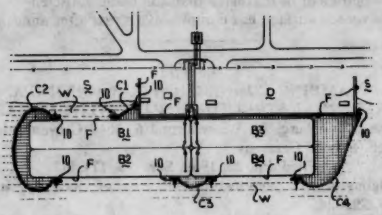
David M. Donovan, New Orleans, La., assignor to Waldemar S. Nelson & Co., New Orleans, La.

Filed Jan. 15, 1981, Ser. No. 225,326

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—65 29 Claims

1. A device particularly adapted for attachment to a ferrometallic surface comprising a base member, means carried by said base member for magnetically attaching said base member to a ferrometallic surface, means carried by said base member for imparting buoyancy to said base member relative to a body of water, means carried by said base member for attaching said base member to a floating element whereby said device functions as the connecting intermediary between the ferrometallic surface and the floating element, and said last-mentioned attaching means is mounted for relative movment with respect to said base member.



4,348,137

PIVOTAL CONNECTION FOR ARTICULATED COLUMN OF SEA-BED WORKING STRUCTURE

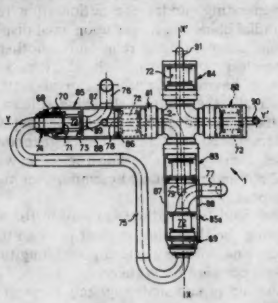
Samuel Tuson, Mesnil-Le-Roi, and Jean-Pierre Ghilardi, La Bouffemont, both of France, assignors to Entreprise d'Equipements Mecaniques et Hydrauliques EMH, France

Filed Aug. 7, 1978, Ser. No. 931,421

Claims priority, application France, Aug. 12, 1977, 77 24912

Int. Cl.³ E02B *17/00*

U.S. Cl. 405—202 5 Claims



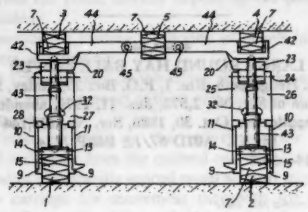
1. A pivotal connecting device of the kind forming a universal Cardan joint coupling in particular for a compliant or articulated column of a sea-bed working structure, said column being pivotally connected to a base member resting on the sea-bottom so as to be capable of swinging about two axes of rotation extending at right angles to each other and supported by said column and said base member, respectively, rigid connecting ducts being provided between the base member and the column, which ducts are associated with four torsion couplings axially aligned by pairs along the axis of rotation, for the flow of fluids between the column and the base member, each of the couplings associated with the base member being connected with the corresponding coupling associated with the column through a rigid duct, these connecting ducts extending through the inside of a Cardan joint spider which has generally a parallelepipedic hollow shape, wherein at least one rigid connecting duct is provided outside of the spider of the Cardan joint coupling, said duct extending between associated additional torsion couplings aligned along the axis of rotation and connected to the base member and the column, respectively.

4,348,138

SLIDING SUPPORTING GALLERY

Guy Blampain, Verneuil.en.Halatte, and Pierre Grandfils, Precy-sur-Oise, both of France, assignors to Charbonnages de France, Paris, France

Filed Jun. 27, 1980, Ser. No. 163,474
Claims priority, application France, Jul. 6, 1979, 79 17587
Int. Cl.³ E21D *23/00*
U.S. Cl. 405—297 10 Claims



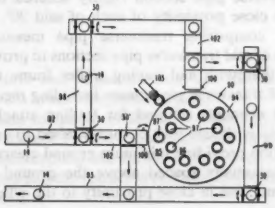
1. A roof support for use in mines between a roof and a floor comprising two pairs of frames spaced from each other laterally of the support and each including an upper frame provided with an articulated track and a lower frame provided with an articulated track, wherein the frames are spaced apart by a large passage for use as heading, an upper cross-member extending between said upper frames, the opposite ends of said upper cross-member being connected to said upper frames, an intermediate upper frame having an articulated track being carried by said upper cross-member and located between said upper frames, jack means associated with each pair of frames and operable to apply a force between the lower frames and the upper cross-member to cause the track of the intermediate upper frame to be applied against the roof of the passage.

4,348,139

GAS FILM WAFER TRANSPORTATION SYSTEM

Javathu K. Hassan, Hopewell Junction, and John A. Paivanas, Hyde Park, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 30, 1980, Ser. No. 145,156
Int. Cl.³ B65G *51/02*
U.S. Cl. 406—10 6 Claims



1. A manufacturing system comprising:

(a) at least two processing stations for performing processing steps on an object being manufactured;

(b) an air track creating a film of air, on the underside of said object, and with force components capable of both holding the object off of said track and moving the object along the track, and extending between said two processing stations for transporting the objects from one station to the other station, the operating level for processing the object in one station being either at a different elevation than the other station, or requires an angular orientation different from the other station, said air track having two sections of different angular orientation relative to each other;

(c) an air track swivelator positioned between said two sections and having a pivot essentially centrally located in the planes of the two sections and normal to the path of the object being transported and being capable of being rotated 360° about said pivot, said swivelator comprising a sensor for detecting the presence of an object and a plurality of air jets for stopping the object, when detected, for attracting the object toward, but out of contact of, the surface of the swivelator during rotation, and for moving the object in either a forward or reverse direction after rotating the swivelator a predetermined number of degrees; and

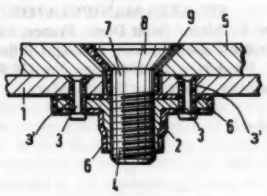
(d) means operable for providing an air flow so as to stop and hold said object on the air film, while said swivelator is rotated, and to move the object after rotation, whereby the object is moved from said one section of air track to said other section.

4,348,140

CONNECTING DEVICE, PREFERABLY FOR SHEET METAL COMPONENTS OF LIGHT METAL ALLOYS

Helmut Bergholz, Hamburg, and Walter Tams, Buxtehude, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 952,654, Oct. 19, 1978, abandoned.
This application Jan. 19, 1981, Ser. No. 226,460
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 7733291[U]
Int. Cl.³ F16B *5/02, 37/04*
U.S. Cl. 411—103 4 Claims



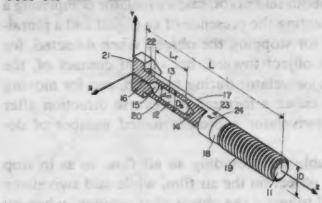
1. An aircraft construction threaded nut assembly for transmitting forces between sheet metal pieces, comprising in combination a piece of sheet metal having first and second holes therein, a nut having a threaded hole, means rigidly securing said nut to said piece of sheet metal, whereby said threaded hole registers with a first hole in the piece of sheet metal, said securing means comprising holding means connected to the nut, at least one rivet hole in said holding means registering with a second hole in said piece of sheet metal, and at least one rivet extending through the rivet hole in the holding means of the nut and through a respective second hole in the piece of sheet metal, said assembly further comprising a coating of synthetic insulating material of sufficient mechanical strength for directly transmitting mechanical stress through the coating covering said holding means substantially on all sides including the wall of the rivet hole in the holding means, whereby the nut is insulated from the piece of sheet metal and from the rivet for releasably securing said piece of sheet metal to a further piece of sheet metal in a rigid, force transmitting manner.

4,348,141

HOLLOW EXTERNALLY THREADED FASTENERS HAVING GREATLY INCREASED DUCTILITY

Norman C. Dahl, 40 Fern St., Lexington, Mass. 02173

Filed Nov. 19, 1979, Ser. No. 95,166
Int. Cl.³ F16B *35/00, 31/02*
U.S. Cl. 411—389 **46 Claims**



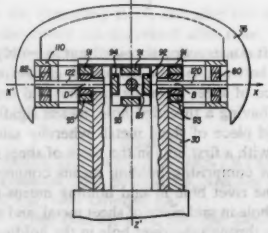
1. A metal fastener having a well-defined yield point and improved elongation beyond the yield point and a tensile strength (force) at least as large as the specified minimum for the grade, size, and threads of said metal fastener, the metal fastener of nominal diameter D, which metal fastener comprises in combination: an externally threaded component having threads of nominal diameter D; a circular, cylindrical shank component having a diameter D_s equal to or substantially equal to said nominal diameter D extending axially to one end of the threaded component; and a head component for the application of torque to the fastener extending axially to the other end of the shank component; the fastener being characterized by an axially extending hollow cavity positioned therein within the shank component, and not extending substantially into the threaded component, the axially transverse cross-sectional shape of the cavity being circular in shape at every pont along the cavity and concentric with said cylindrical shank component, the maximum cross-sectional area of the hollow cavity in the shank component being greater than the minimum cross-sectional area within any part of the hollow cavity which extends into the head or threaded components.

4,348,142

SIX-AXES MANIPULATOR

Jean Figour, Le Mesnil Saint Denis, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 13, 1980, Ser. No. 129,979
Claims priority, application France, Mar. 22, 1979, 79 07254
Int. Cl.³ B25J *3/00*
U.S. Cl. 414—2 **7 Claims**



1. A six-axis manipulator for controlling the extremity of a robot arm, said manipulator comprising:

a central tubular support having an axis;

four bearings on said support and each separated by 90° in a plane perpendicular to said support axis;

a ring having a diameter larger than that of a section of said support, said section lying in said perpendicular plane;

rigid and elastic means for supporting said ring on said tubular support wherein said ring and tubular support are coaxial at rest;

at least four force sensors, for sensing forces in four directions, on each of said bearings;

logic means for converting signals from said sensors into individual translational components along three axes and into individual rotational components about said three axes; and

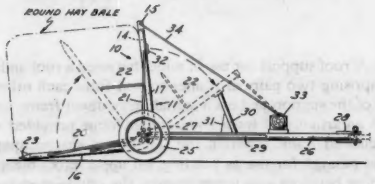
means for transmitting said components as command signals to said robot.

4,348,143

LARGE ROUND HAY BALE MOVER

Clofford L. Hedgespeth, Rte. 1, P.O. Box 29, Finley, Ky. 42736

Continuation of Ser. No. 2,572, Jan. 11, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,144
Int. Cl.³ A01D *87/12;* B60P *1/14*
U.S. Cl. 414—24.5 **7 Claims**



1. A large round hay bale mover for trailing use behind a towing vehicle comprising a large round hay bale cradle and a two-wheeled trailing unit, said cradle comprising pipe means formed to provide a pair of straight fork elements adapted to pass in a forward downwardly inclined ground engaging position under its center of gravity and while remaining in ground engaging position to raise to an inclined preliminary fully loaded condition a large round hay bale, the pipe of each fork element having a 90° vertical bend mounted in close proximity to the wheel axis extending therefrom to form back support elements for the bale, and horizontal connecting means extending between said back support elements to provide a further back support, said horizontal connecting means comprising the upper ends of said back support elements provided with transverse bends continuing horizontally and adapted to provide a rigid integral horizontal connecting means, an outwardly extending transverse pipe section rigidly secured to said pipe means in the close proximity of each of said 90° bends, said trailing unit comprising transverse pipe means extending through both of said transverse pipe sections to provide pivotal connections therewith and having trailer frame means connected to said transverse pipe means including means for raising said fork elements adapted for trailing attachment to a towing vehicle with said fork elements raised to an upwardly inclined position providing minimum ground clearance at said 90° bend substantially spaced above the ground contacting wheel perimeter and in close proximity to the wheel axis.

4,348,144

METHOD AND APPARATUS FOR LOADING A MULTI-PLATEN PRESS

Victor R. Nelson, 2700 SW. Summit Dr., Oswego, Oreg. 97034

Filed Jun. 27, 1980, Ser. No. 163,813
Int. Cl.³ B65G *1/06*
U.S. Cl. 414—277 **13 Claims**

1. The method of loading a plurality of panels into a multi-platen press, comprising:

(a) infeeding a panel onto each of a plurality of vertically spaced trays mounted for movement with a carriage,

(b) while retaining the carriage in stationary position, pushing the panels forwardly on the trays into abutment with verti-

cally aligned stops extended in front of the trays, whereby to align the forward ends of the panels vertically,

retracting the stops away from the panels,

(d) while holding the panels against rearward movement on the trays, moving the carriage forwardly to move the trays and panels into the spaces between platens of the open multi-platen press, and

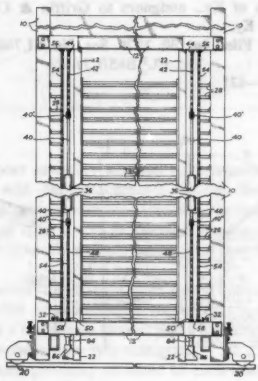
(e) while holding the panels against rearward movement relative to the press, retracting the carriage and withdrawing the trays from the press, thereby depositing the panels on the press platens.

3. Apparatus for loading a plurality of panels into a multi-platen press, comprising:

(a) a main frame located on the infeed side of the multi-platen press and having a panel outfeed end facing said infeed side of the press,

(b) a carriage mounted on the main frame for movement toward and away from the outfeed end of the main frame,

(c) a plurality of vertically spaced panel support trays mounted on the carriage for movement therewith for retractable extension forwardly of the outfeed end of the main frame for



insertion into and retraction from the spaces between the press platens when the press is open,

(d) stop means mounted on the main frame adjacent the outfeed end thereof for movement between an extended position for intercepting the forward ends of panels supported on the trays and the retracted position displaced from panels on the trays,

(e) sweep arm means mounted on the carriage for movement therewith and for movement relative thereto between a retracted position displaced from the trays for receiving panels onto the trays and an extended position for abutment with the rearward ends of the panels on the trays for moving the panels forwardly into abutment with the forward ends with the extended stop means for aligning the forward ends of the panels vertically, the sweep arm means being movable with the carriage for moving the vertically aligned panels into the press when the stop means are retracted, and

(f) panel stripper means mounted movably on the main frame for releasably engaging panels on the trays within the press for retaining the panels in the press while the trays are retracted from the press.

4,348,145

WOOD COMPARTMENT

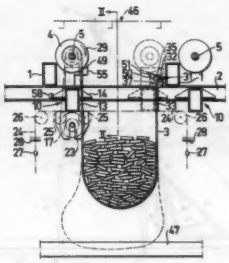
Erland Marklund, Skelleftea, and Lars Lindström, Byske, both of Sweden, assignors to Renholmens Mekaniska Verkstad AB, Byske, Sweden

Filed Jun. 13, 1979, Ser. No. 48,581

Claims priority, application Sweden, Jun. 16, 1978, 7806953; Sep. 26, 1978, 7810092; Jun. 8, 1979, 7905011

Int. Cl.³ B07C *5/14*

U.S. Cl. 414—288 **10 Claims**



1. Apparatus for handling elongated objects such as pieces of wood includes at least one elongated flexible member for forming the bottom and sides of an object-handling compartment having a longitudinal dimension and a transverse dimension, said flexible member having a first end and a free end; coiling means associated with said first end of said flexible member for winding up and unwinding said flexible member; attaching means at said free end of said flexible member; an attaching mechanism operable for selectively being connected to and disconnected from said attaching means whereby when said attaching means and said attaching mechanism are connected, said flexible member can be suspended from its ends to form said compartment and whereby said attaching means can be disconnected from said attaching mechanism to loosen said flexible member to enable emptying of the compartment; and means arranged after loosening of the flexible member to introduce the flexible member in the attaching mechanism so as to bring the attaching means by winding of the flexible member onto the coiling means, to retaining engagement with the attaching mechanism, said attaching mechanism including a bifurcated holder for said flexible member, said holder being displaceable relative to said flexible member in the longitudinal direction of the compartment to loosen said flexible member when displaced in one direction, and to straddle the flexible member after introduction thereof into the attaching mechanism, when displaced in the opposite direction, so as to allow for the attaching means to be brought by winding of the flexible member onto the coiling means, to its retaining engagement with the attaching mechanism.

4,348,146

SELF-ERECTING SURGE BIN

J. Donald Brock, Chattanooga, TN, assignor to Astec Industries, Inc., Chattanooga, Tenn.

Division of Ser. No. 912,501, Jun. 5, 1978, Pat. No. 4,249,351. This application May 9, 1980, Ser. No. 148,509

Int. Cl.³ B65G *67/08*

U.S. Cl. 414—332 **5 Claims**

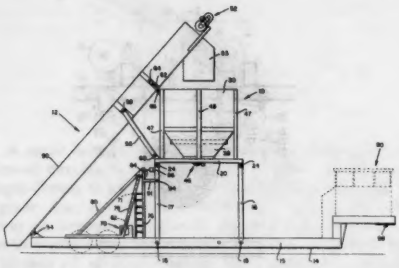
1. Apparatus for transporting and temporarily storing asphalt, said apparatus comprising:

trailer means;

bin means having a raised and a lowered configuration with respect to said trailer means, said bin means being pivotally attached to said trailer means and including a plurality of connected wall sections defining a storage bin area open at the top and at the bottom, door means selectively opening and closing said opening in the bottom of said

storage bin area, and collapsable support leg means pivotally attached to said trailer means and to said wall sections such that said wall sections remain substantially vertical when said bin means is in said raised and said lowered configuration;

conveying means for conveying asphalt to said bin means and having a raised and a lowered configuration with respect to said trailer means, said conveying means being pivotally attached to said trailer means, and to said bin means; and



erecting means for raising or lowering said conveying means and said bin means from their lowered or raised configuration to their raised or lowered configuration, respectively;

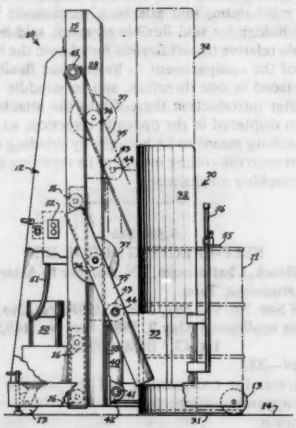
at least one of said wall sections of said bin means being pivotally mounted to said other wall sections so as to permit said conveying means to nest within said bin means when said conveying means and said bin means are in said lowered configuration.

4,348,147

HIGH-LEVEL DUMPING APPARATUS

J. Thomas Helm, Franklin, Tenn., assignor to Dozier Equipment International Company, Nashville, Tenn.

Filed Aug. 11, 1980, Ser. No. 176,855
Int. Cl.³ B65G *65/24*
U.S. Cl. 414—420 **8 Claims**



1. A high-level dumping apparatus comprising:

(a) an upright frame having a front and back and upper and lower frame portions,

(b) an upright carriage track extending between said upper and lower frame portions,

(c) a guide track extending between said upper and lower frame portions in front of said carriage track,

(d) a carriage mounted for reciprocable movement along said carriage track,

(e) means for reciprocably moving said carriage,

(f) load carrying chute means, including a tilt arm having an upper free end portion,

(g) a guide element fixed to said tilt arm for cooperative engagement with said guide track to permit reciprocable movement of said tilt arm along said guide track and pivotal movement of said tilt arm relative to said upright frame,

(h) a trip member fixed to said upper frame portion in the upward path of movement of the upper free end portion of said tilt arm, so that engagement of said trip member by said upward moving tilt arm causes said chute means to pivot upward about the pivotal axis of said trip member, and

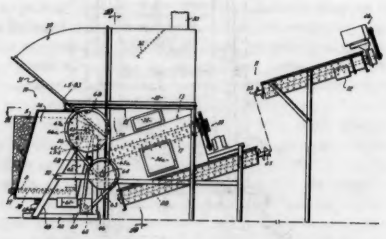
(i) a lift member on said carriage cooperative with said chute means for moving said chute means upward with said carriage and for exerting an upward thrust upon said chute means at a predetermined distance along said tilt arm from said guide element.

4,348,148

DUMPER APPARATUS AND METHODS

Edwin Wilding, Louisville, and James W. DeVere, Jeffersontown, both of Ky., assignors to Griffin & Company, Inc., Louisville, Ky.

Filed Jul. 30, 1979, Ser. No. 61,748
Int. Cl.³ B65B *21/02*
U.S. Cl. 414—421 **3 Claims**



1. Apparatus for dumping tobacco into a feeder apparatus having a hood with an opening for receiving tobacco, said apparatus including a pivoted dumper supporting a load of tobacco and being pivotable from a first position for receiving tobacco to a raised position within said opening for dumping tobacco, the improvement comprising,

means for holding said dumper in said raised position within said opening,

said means including a first element pivoting with said dumper from said first position to said raised position, and

a selectively actuable blocking element movable to a blocking position with respect to said first element when said dumper is in its raised position,

wherein said first element comprises a dumper drive sprocket having a central pivot axis and having an aperture therein spaced from said axis, and wherein said blocking element includes a movable brake pin, said aperture being operatively aligned with said brake pin when said dumper is in its raised position and said brake pin being movable into said aperture when said dumper is in its raised position for locking said dumper in its raised position, and

further including two drive sprockets, each having a central axis, and an aperture therein spaced from said axis, and further including two movable brake pins, each operatively associated with a respective drive sprocket, said

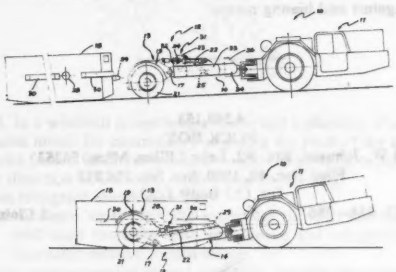
apertures being operatively aligned with respective ones of said pins when said dumper is in its raised position, said brake pins being movable into respective ones of said apertures when said dumper is in its raised position for locking said dumper in its raised position.

4,348,149

MOBILE TRANSPORTER FOR MINES

Charles R. Deamer, Church Point, Australia, assignor to Noyes Bros. Pty. Limited, St. Leonards, Australia

Filed Apr. 2, 1980, Ser. No. 137,115
Claims priority, application Australia, Apr. 17, 1979, PD8383
Int. Cl.³ B60P *3/00*
U.S. Cl. 414—458 2 Claims



1. A transport assembly adapted to transport a variety of attachments with the attachments having three mounting points, two of which comprise transversely spaced horizontally projecting spigots and the third mounting point being a forwardly horizontally projecting pin, said assembly comprising:

(a) a horizontal "U"-shaped main frame having two generally parallel co-extensive transversely spaced side arms joined by a transverse base so that a load receiving area is defined between the two side arms,

(b) a subframe pivotally attached to each arm so that both subframes pivot about a common horizontal axis extending generally transverse of the normal direction of travel of the transport assembly,

(c) a wheel rotatably fixed to each subframe so that the wheels are rotatable about a common horizontal axis parallel to the pivot axis of said arms,

(d) coupling means adapted to secure an attachment to the transport assembly, said coupling assembly comprising three spaced reaction points of which two are transversely spaced and the third is longitudinally spaced relative to the others, each of said subframes having one of said two reaction points with the third reaction point being located on said transverse base, said two reaction points each comprising a latch which consists of a recessed member adapted to receive one of said spigots and a retainer adapted to selectively secure the spigot within the recessed member, said third reaction point including a hollow member having a generally horizontal rearwardly open passage adapted to receive said pin, and

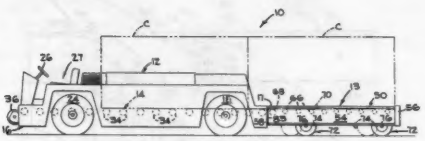
(e) motor means extending between said subframes and main frame so as to pivotally move said subframes between an upper and a lower position so that said attachment is locatable within said space when said subframes are in said lower position, and is supported by said three reaction points when said subframes are in said upper position.

4,348,150

MOBILE CARGO HANDLING SYSTEM AND METHOD

Donald M. Ingham, Santa Clara, and William B. Walker, Los Gatos, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed May 19, 1980, Ser. No. 151,045
Int. Cl.³ B60P *1/52*
U.S. Cl. 414—529 4 Claims



4. An apparatus including a powered container supporting deck of predetermined length for selectively transferring container loads of different lengths between two locations:

when handling one or more containers defining a short container load having a total length less than the length of said powered container supporting deck, said apparatus comrpising:

means defining a longitudinally extending steerable self-propelled mobile transporter including said powered container supporting deck, means defining power operated container stops on said deck movable between an inoperative position out of the path of movement of the container and a container restraining position within the path of movement of the container, and controllable power means for actuating said container supporting deck for moving said short load onto said deck from said first location and off said deck at said second location after said mobile transporter has been driven to said second location and when said stops are in their inoperative positions, said controllable power means including means for raising and lowering said stops with the stops being in their container retaining position when said transporter is driven between said two locations;

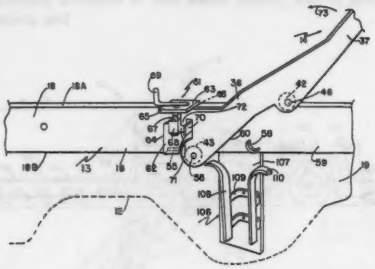
when handling one or more container defining a long load having a total length greater than said powered container supporting deck, said apparatus additionally comprising:

means defining a dolly having a front and rear end and a longitudinal axis, swivel caster wheels supporting said dolly, means releasably connecting said dolly to said transporter with the longitudinal axes of said transporter and said dolly being maintained substantially parallel relative to a vertical plane, said dolly including an unpowered deck means having a container supporting surface defined solely by unpowered freely rotatable elements for supporting a portion of a long load, stop means on the rear end of said dolly being spaced from said front end of said dolly a distance less than the length of the rearmost of said one or more containers of said long load for assuring that a portion of said rearmost container is supported on said powered transporter deck when said rearmost container is contacting said dolly stop means, said power transporter deck supporting a sufficient portion of the rearmost one of said one or more containers for powering said containers onto or off of said dolly deck upon selective actuation of said controllable power means and upon moving said stops into their inactive positions.

4,348,151
TRUCK WINCH ASSEMBLY

Lorimer Olson, Hawarden, Canada, assignor to WGM Safety Corp., Franklin, Pa.

Filed May 19, 1980, Ser. No. 151,180
Int. Cl.³ B60P 1/48
U.S. Cl. 414—542 13 Claims



11. A truck winch assembly, for use in a truck cargo area comprising:

a frame assembly attachable within said truck cargo area, said frame assembly comprising a vertically situated front frame component secured at the front of said truck cargo area and a pair of vertically situated side frame components secured along the sides of said truck cargo area, said side frame components further comprising horizontally extending rail elements having upper and lower rail surfaces;

a lifting yoke; and

roller means mounted on said lifting yoke for supporting said lifting yoke within said frame assembly for movement from a stored position to an elevated lifting position and vice-versa, said roller means further cooperating with said horizontally extending rail elements for moving said lifting yoke along said frame assembly when said lifting yoke is in the lifting position;

said roller means comprising a first pair of rollers, one roller mounted on each leg of said lifting yoke, for cooperation with the upper rail surfaces of said horizontally extending rail elements, and a second pair of rollers mounted on said lifting yoke, spaced apart from said first pair of rollers, for cooperation with the lower rail surfaces of said horizontally extending rail elements.

4,348,152
ARTICLE RETRIEVAL DEVICE

Shunichi Takamatsu, Osaka, Japan, assignor to Itoki Co., Ltd., Osaka, Japan

Division of Ser. No. 92,754, Nov. 9, 1979, Pat. No. 4,333,005.
This application Aug. 15, 1980, Ser. No. 178,574
Claims priority, application Japan, Nov. 10, 1978, 53-137779; Nov. 10, 1978, 53-137780
Int. Cl.³ B65G 1/06
U.S. Cl. 414—785 9 Claims

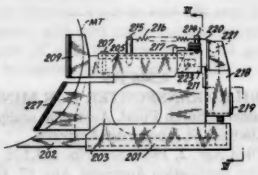
1. A device for retrieving an article comprising:

carriage means displaceable from a first position out of engagement with said article to a second position in engagement with said article;

an arm extending forwardly from said carriage for engagement with said article, said arm having a tapered end for engaging the bottom portion of said article to raise said article;

first and second guide plates pivotally mounted to said carriage and disposed above said arm, said guide plates being displaceable from a first position in engagement with said article to a second position out of engagement with said article;

biasing means connected to said first and second guide plates to urge said first and second guide plates to said first position thereof;



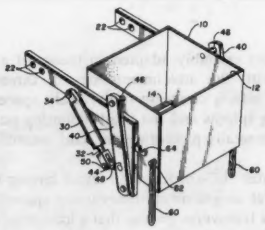
means for displacing said carriage means; and

means for displacing said first and second guide plates from said first position thereof to said second position thereof against said biasing means.

4,348,153
ROCK BOX

Ardell W. Johnson, Rte. #2, Lake Lillian, Minn. 56253

Filed Dec. 10, 1980, Ser. No. 214,912
Int. Cl.³ B60P 1/22
U.S. Cl. 414—786 2 Claims



1. A method of loading, transporting and dumping farm rocks conveniently and economically comprising the steps of:

(a) fastening a rock box to the frontal part of a farm tractor in upright position wherein said rock box including plurality of mounting brackets, plurality of elevation arms, a single hydraulic cylinder and a chain and a hook arrangement;

(b) making the hydraulic connections between said hydraulic cylinder and the operator's controls of said farm tractor via hydraulic systems of said farm tractor;

(c) lowering said rock box to the ground level by advancing piston out of said cylinder;

(d) rolling rock box 90 degrees by advancing said farm tractor;

(e) advancing said rock box up to the rock by advancing tractor,

(f) loading the rock into the box manually

(g) rotating said rock box to upright position by retracting the piston of said hydraulic cylinder;

(h) transporting the farm tractor to dump location;

(i) connecting said chain to said hook;

(j) dumping the contents of said rock box by advancing the piston out of said hydraulic cylinder;

(k) withdrawing the piston into said hydraulic cylinder to bring said rock box to upright position;

(l) raising said rock box to upright position; and

(m) unhooking said chain from said hook.

4,348,154

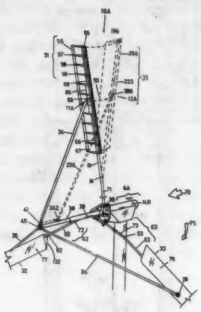
ADJUSTABLE VANE WINDMILLS

William L. Ducker, Lubbock, Tex., assignor to Wind Engineering Corporation, Lubbock, Tex.

Continuation-in-part of Ser. No. 874,222, Feb. 1, 1978, Pat. No. 4,183,715. This application Jan. 11, 1980, Ser. No. 111,251

Int. Cl.³ F03D 7/04

U.S. Cl. 416—43 6 Claims



1. In a windmill comprising a tower and a plurality of airfoil blades, means for controllably adjusting the pitch of the airfoil blades from a feathered position to any run position relative to the direction of the wind, said means comprising:

an elongated sleeve member,

an actuator shaft coaxially extending through said sleeve, said shaft rotatable with said sleeve and longitudinally moveable relative to said sleeve,

hub means coupled to said sleeve for rotation therewith,

a plurality of elongated spar members equal in number to the number of airfoil blades, each of said spar members having a central portion rotatively in fixed spatial relation to and rotatably supported on said hub at an angle to the axis of said actuator shaft and a peripheral portion angularly extending from said central portion and fixedly connected to one of the blades, said blades extending rearwardly and radially from said hub, said hub located rearward of said tower

collar means mounted for rotation with said actuator shaft,

elongated rigid strut means pivotally connected at each end respectively to said collar means and to the airfoil blade intermediate its ends, and

control means operatively coupled to said actuator shaft for longitudinally moving said shaft and, through said strut means, rotating each of the blades beween and including the feathered position and any run position and moving each of the blades in an arcuate path for changing the dihedral angle of the blades, and spar synchronization means connected between the central portion of each of said spars and said actuator shaft whereby to maintain the same angular relations between each of said spar members.

4,348,155

WIND TURBINE BLADE PITCH CONTROL SYSTEM

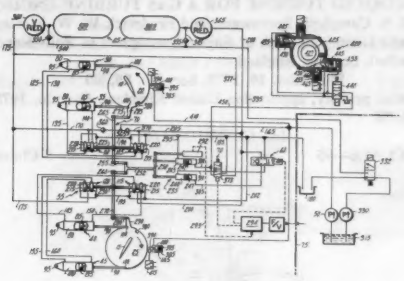
Philip E. Barnes, West Hartford; Millard G. Mayo, Wethersfield, and Robert Sherman, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 17, 1980, Ser. No. 130,658

Int. Cl.³ F03D 7/02

U.S. Cl. 416—46 19 Claims

1. A pitch control system for a wind turbine having a plurality of blades, said control system comprising a plurality of hydraulic actuators, each connected to one of said blades and adapted to pivot said blade about the longitudinal axis thereof in blade pitch adjusting and feathering modes of operation; means in fluid communication with said actuators for selectively distributing hydraulic fluid to said actuators in both pitch adjusting and feathering modes of operation; first and redundant second sources of pressurized hydraulic fluid in fluid communication with said distributing means for supplying hydraulic fluid thereto for delivery to said actuators; first means communicating with said first hydraulic fluid source for controlling the introduction of hydraulic fluid from said first source to said distributing means in said blade pitch adjusting mode and second means communicating with said second



hydraulic fluid sources for controlling the introduction of hydraulic fluid from said redundant second hydraulic fluid sources in said blade feathering mode such that each of said redundant sources supplies hydraulic fluid to at least a single one of said actuators associated with each of said blades independently of other hydraulic actuators associated therewith whereby each of said redundant second sources of hydraulic fluid is individually capable of powering all of said blades simultaneously in said feather mode of operation.

4,348,156

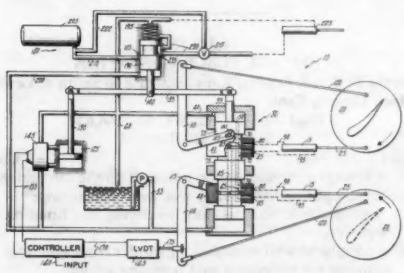
BLADE PITCH ACTUATION SYSTEM

Merritt B. Andrews, Westfield, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 17, 1980, Ser. No. 130,656

Int. Cl.³ B64C 11/40; F03D 7/04

U.S. Cl. 416—48 11 Claims



1. A pitch actuation system for adjusting the pitch of a plurality of blades, said system comprising a plurality of hydraulic actuators, each being associated with, and connected to a single blade, for driving said blade in a pitch-change mode of operation, said system further comprising a control valve in fluid communication with said actuators and a primary hydraulic fluid source, said control valve comprising an input member in fluid communication with said hydraulic fluid source and a plurality of feedback members each in fluid communication with one of said blade actuators, said input member, in response to a command signal thereto, being positionable into fluid communication with said feedback members for supplying hydraulic fluid therethrough to said blade actuators for the operation thereof, operation of said blade actuators in response

to hydraulic fluid admitted thereto through said input and feedback members causing the positioning of said feedback members out of fluid communication with said input members thereby nulling said control valve and arresting further operation of said blade actuators for maintenance of a desired blade pitch setting.

4,348,157

AIR COOLED TURBINE FOR A GAS TURBINE ENGINE

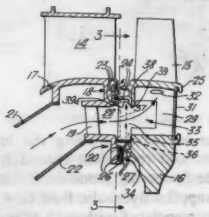
David A. Campbell, Borrowash, and Frederick W. W. Morley, Castle Donington, both of England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 16, 1979, Ser. No. 85,300

Claims priority, application United Kingdom, Oct. 26, 1978, 42094/78

Int. Cl.³ F01D *5/18*

U.S. Cl. 41.6—95 **5 Claims**



1. An air cooled turbine for a gas turbine engine comprises a rotor including a disc carrying a stage of rotor blades, static structure adjacent the outer portion of the rotor, inner and outer annular seals between the static structure and the rotor, the seals defining between them a space adjacent the rotor, pre-swirl nozzles upstream of said space for directing cooling air from the static structure and across the space toward the rotor, cooling air entry means adapted to allow said cooling air to enter the blades to cool them, and deflector means mounted on the rotor in between said seals, said deflector means deflecting fluid of higher pressure than said cooling air which leaks radially outwardly through said inner seal away from said cooling air entry means.

4,348,158

SEWAGE PUMPING STATION

Marvin E. Wood, Lenexa, Kans., assignor to Smith & Loveless, Inc., Lenexa, Kans.

Filed Jul. 7, 1980, Ser. No. 166,624

Int. Cl.³ F04B *49/04*

U.S. Cl. 417—40 **9 Claims**

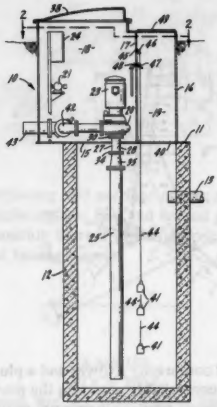
8. A sewage pumping station mounted on the top peripheral edge of an open ended sewage wet well, comprising:

A. a generally horizontal floor overlying and fitted on said wet well;

B. a peripheral wall extending upwardly from said floor and defining the interior of said pumping station;

C. a generally vertical partition extending upwardly from said floor within said peripheral wall, said partition dividing the interior of said pumping station into a machinery chamber and an access chamber, at least a portion of each of said chambers being directly vertically above said wet well, and said partition hermetically isolating said chambers from each other;

D. said machinery chamber containing electrically operated sewage pumping means directly above said wet well and sewage conduit means comprising unitary pipe means extending downwardly from said sewage pumping means through a hole in said floor into said wet well, said pipe means having flange means at its upper end within said machinery chamber connected to said sewage pumping means and having flange means at its bottom end within said wet well connected to other pipe means that terminates adjacent the bottom of said wet well, said hole being sealed by welding said unitary pipe means to the edge of said floor that defines said hole in said pumping station such that said machinery chamber is hermetically isolated from said wet well, and removable cover means for closing the top of said machinery chamber; and



E. a manway opening in said floor within said access chamber that provides continuous access to the inside of said wet well beneath said pumping station, said means for controlling the operation of said pumping station comprising displacement switches suspended in said wet well by wires that pass horizontally through an elevated hole in said partition and extend downwardly through said manway opening, and a separate removable cover closing the top of said access chamber.

4,348,159

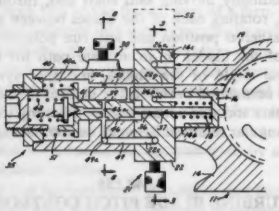
CONVERTIBLE PUMP SERVO-VALVE CONTROL

John L. Acheson, Franklin, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jan. 7, 1980, Ser. No. 110,041

Int. Cl.³ F04B *49/08*; F04C *15/04*

U.S. Cl. 417—220 **6 Claims**



1. A control system for a variable displacement pump having a body provided with an output port and a supply port, and a piston disposed in a control cylinder and movable under pressure therein, said piston operatively controlling the position of a pump displacement control device such that an increase in pressure acting on said piston tends to increase the pump displacement and vice versa, said system comprising:

a servo-valve having a body provided with an output pressure passage communicating with said pump output port, a pump control passage communicating with said control cylinder, a servo-valve control passage communicating

with said output pressure passage through a restriction, a return passage communicating with said pump supply port, and a servo-valve member movable in a servo-valve bore in response providing a pump control pressure which is derived from a pilot flow through and varied by said servo-valve member and which is increased as said pressure differential decreases and vice versa;

means allowing and controlling a return flow of a fraction of the pump output through said restriction, including a spring biased displacement control valve having a body attached to said servo-valve body, means for coupling said pump piston and said control valve such that movement of the latter in the direction which decreases pump displacement increases the spring bias of said control valve and vice versa, said means further including a spring biased pressure relief valve having a body attached to said displacement control valve body, said valve bodies having a series of interconnected passages providing for said return flow of a fraction of the pump output through said restriction and both the displacement control valve and the pressure relief valve in parallel whereby pump displacement is caused to vary inversely with pump output pressure.

4,348,160

METERING SYRINGE

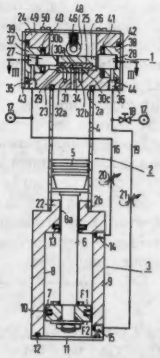
Guido Heyneman, Knokke, Belgium, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,139

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910946

Int. Cl.³ F04B *37/00*

U.S. Cl. 417—403 **8 Claims**



1. In a metering syringe for conveying fluids in predetermined volumes from one container to another container, comprised of a piston-burette with a pneumatic drive connected to a valve means assembled so that said piston-burette, valve means and pneumatic drive form a unitary structural unit, the improvement comprising wherein:

said pneumatic drive is provided with a double-headed piston (7) attached to a free end of a piston rod (6) of the piston-burette (2);

said piston-rod (6) having a diameter selected of such a size relative to the diameter of the double-headed piston (7) that two pneumatically effective piston-head surfaces (F1 and F2) differing significantly in area from one another are defined, with one of said piston-head surfaces being at least twice as large in effective area relative to the other of said piston-head surfaces, said piston-head surfaces being operationally connected with a compressed air source (17) in such a manner that the piston-head surface (F1) with a relatively smaller diameter is constantly charged with compressed air from said source and the piston-head surface (F2) with a relatively larger diameter is connected to said source via a control valve (18) so as to be selectively charged with compressed air for controllably moving said double-headed piston.

4,348,161

PRESSURE CONVERTING APPARATUS

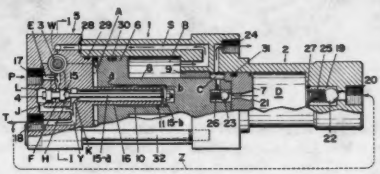
Tsugio Shibata, 21-4, Yusentei, Nishi-ku, Fukuoka-shi, Fukuoka, Japan

Filed May 12, 1980, Ser. No. 149,054

Claims priority, application Japan, Mar. 15, 1980, 55-32845

Int. Cl.³ F04B *17/00*; F15B *7/02*

U.S. Cl. 417—403 **3 Claims**



1. Pressure converting apparatus comprising:

(a) low-pressure and high-pressure-producing cylinders connected coaxially, said respective cylinders having low-pressure and high-pressure-producing cylinder chambers of different effective bore areas, said bore area of said high-pressure-producing cylinder chamber being smaller than said bore area of said low-pressure-producing cylinder chamber;

(b) a coaxial piston rod slidably disposed in said coaxial low-pressure and high-pressure-producing cylinder chambers, said coaxial piston rod being provided with low-pressure and high-pressure-producing pistons at opposed longitudinal ends thereof, said low-pressure and high-pressure-producing pistons each dividing said respective cylinder chambers into a front piston chamber and a rear piston chamber;

(c) a rear cover block attached to the rear of said low-pressure cylinder, said rear cover block incorporating a low-pressure liquid inlet, a low-pressure liquid outlet, a directional control valve, and a pilot valve, said directional control valve and said pilot valve cooperating so as to alternatively supply low-pressure fluid into said front and rear piston chambers of said low-pressure-producing cylinder, thus enabling an automatic reciprocation of said piston rod;

(d) an automatic pilot valve operating mechanism incorporated in said rear cover block, said mechanism being operably interconnected with the movement of said piston rod so as to automatically operate said pilot valve corresponding to the reciprocal movement of said piston rod;

(e) a secondary fluid by-pass line directly supplying a portion of said low-pressure fluid discharged from said pilot valve to said high-pressure-producing cylinder;

(f) a front cover block attached to the front of said high-pressure-producing cylinder, a suction valve disposed in said front cover block and communicating said secondary fluid by-pass line with said front piston chamber of said high-pressure-producing cylinder allowing one-way supplying of said low-pressure fluid to said front piston chamber of said high-pressure-producing cylinder from said pilot valve;

(g) an exhaust valve disposed in a front portion of said coaxial piston rod, said exhaust valve communicating said front piston chamber of said high-pressure-producing cylinder with said rear piston chamber of said high-pressure-producing cylinder through a passage formed in said high-pressure-producing piston allowing one-way supplying of said low-pressure fluid into said rear piston chamber

of said high-pressure-producing cylinder from said front piston chamber of said high-pressure-producing cylinder; and

(h) a high-pressure-fluid outlet formed in said high-pressure-producing cylinder, said high-pressure-fluid outlet communicating with said rear piston chamber of said high-pressure-producing cylinder;

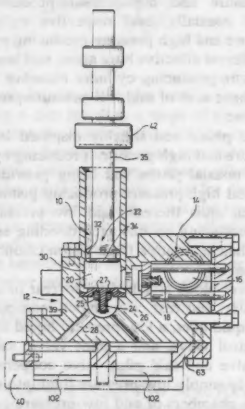
whereby, upon said automatic reciprocation of said coaxial piston, said low-pressure fluid is pressurized in said front piston chamber of said high-pressure-producing cylinder twice per one reciprocation of said coaxial piston rod thus converting said low-pressure liquid to a high pressure liquid and said high-pressure liquid is pumped out through said high-pressure-fluid outlet.

4,348,162

COMBINATION AUTOCLAVE PUMP AND NOZZLE

Derek V. Mancini, Markham, Canada, assignor to Consumers Glass Company Limited, Etobicoke, Canada

Filed Nov. 30, 1979, Ser. No. 99,033
Int. Cl.³ F04B *39/00*; B08B *3/02, 9/00*
U.S. Cl. 417—431 **11 Claims**



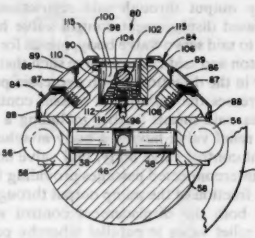
1. A fluid dispensing piston pump to be cleaned in place having an operating position and a cleaning position comprising a cylinder having an area of larger diameter adjacent the lower end, a closing member adjacent the lower portion of said cylinder and housing, an outlet check valve, a piston member having a face portion and a stem portion, said stem portion extending outwardly along the axis of said cylinder away from said closing member, an inlet check valve located below top dead centre of the piston pumping stroke, sealing means associated with said stem for enaging the upper end of said cylinder when said piston member is lowered into said cylinder for cleaning of the apparatus, such that said face is within the cylinder area of larger diameter breaking the seal between said piston face and cylinder wall, the arrangement being such that high temperature steam or a cleaning fluid may be introduced through said inlet check valve to fill the cylinder chamber when said piston is positioned for cleaning to sterilize the components of the pump including the piston face and stem without disassembling the pump wherein the upper end of said cylinder is normally open and said sealing means is secured to said stem and adapted to engage the upper end of said cylinder when said piston face is positioned within the cylinder area of larger diameter.

4,348,163

FUEL INJECTION PUMP LIMIT MECHANISM

Wesley B. Gilbert, Windsor, Conn., assignor to Standadyne, Inc., Hartford, Conn.

Filed Aug. 11, 1980, Ser. No. 177,277
Int. Cl.³ F04B *29/00*
U.S. Cl. 417—462 **9 Claims**



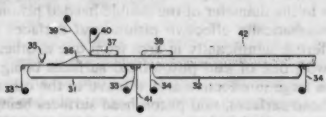
1. In a fuel injection pump for an internal combustion engine having a charge pump with linear pumping means, actuating means for periodically actuating the pumping means in one linear direction thereof in synchronism with an associated internal combustion engine for periodically delivering pulses of pressurized fuel for injection of fuel charges into the internal combustion engine, and a stroke limit mechanism for variably setting a limit for the pumping means in the opposite intake stroke direction thereof for setting a fuel charge limit, the stroke limit mechanism comprising an operator shiftable in opposite pumping stroke increase and pumping stroke decrease directions thereof mechanical means connected to the operator and providing a limit stop for setting the intake stroke limit of the pumping means in accordance with the position of said operator, and operator abutment means including first fixed abutment means and second abutment means on the operator engageable therewith to set a limit for said operator in at least its said decrease direction to set a predetermined minimum stroke limit for the linear pumping means, the improvement wherein the first and second abutment means comprise wear compensation means adapted to wear at a predetermined rate to extend the operator limit in its said decrease direction to generally match the wear of said mechanical means and generally maintain the said predetermined minimum stroke limit setting of the linear pumping means.

4,348,164

APPARATUS FOR CONTINUOUS PRODUCTION OF A SLAB OF POLYURETHANE FOAM

Osamu Fujii, Kounosu; Toshio Kishimoto, Kawagoe; Hisao Kosuge, Sakato, and Ryoji Nagamine, Kawagoe, all of Japan, assignors to Toyo Rubber Chemical Industrial Corporation, Tokyo, Japan

Continuation of Ser. No. 56,956, Jul. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 838,449, Oct. 3, 1977, abandoned. This application Dec. 4, 1980, Ser. No. 213,046
Claims priority, application Japan, Oct. 4, 1976, 51-119101; Oct. 4, 1976, 51-119102
Int. Cl.³ B29D *27/04*
U.S. Cl. 425—89 **5 Claims**



1. An apparatus for continuous production of a slab of poly-

urethane foam having a fabric sheet laminated on at least one of its surfaces, comprising:

(A) a horizontally moving trough which comprises a bottom plate or surface portion including first and second endless belt conveyors arranged one after the other in a horizontal direction and a pair of sidewalls each including a horizontally movable vertical sheet;

(B) feeding means for feeding a foamable polyurethane composition to the moving trough to form a foaming mass on the moving trough;

(C) pressure means for lightly pressing the top surface of the foaming mass over a zone including a zone extending from the foaming completion point to a point just prior to the completion of curing; and

(D) sheet feeding means for continuously feeding a fabric sheet between the under surface of the foaming mass and the second endless belt conveyor through the space between the first and second endless conveyors while said foaming mass remains adhesive though completely foamed, so as to bond the fabric sheet to the under surface of said foaming mass substantially without impregnating the fabric sheet with the polyurethane composition.

4,348,165

ASSEMBLY FOR CLAMPING MOLD TO PLATENS OF INJECTION-MOLDING MACHINE

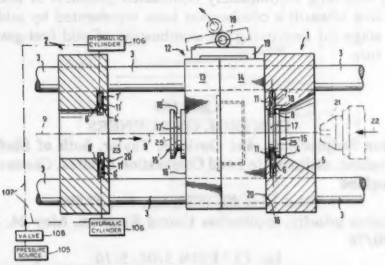
Ernst Vostrovsky, Oberschleissheim, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 23, 1980, Ser. No. 190,162

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938665

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—185 **3 Claims**



1. In an injection-molding machine, the improvement which comprises in combination:

a pair of separable mold halves jointly defining a mold cavity and having oppositely directed sides each formed with a respective projection along an axis, each of said projections having an annular flange defined by an outwardly open annular groove separating the respective flange from the respective side, each flange having a beveled camming surface defining a flank of the respective groove;

a pair of relatively movable platens on said machine spaced apart along said axis and receiving said mold halves between them, each of said platens having a bore receiving a respective one of said projections;

respective gripper means on each of said platens engageable with the projection of a respective mold half for form-locking and force-locking retention thereof on the platen, each of said gripper means including:

a plurality of sliding members reciprocatingly shiftable on the respective platen toward and away from said axis and engageable in the groove between the flange and said side of the respective mold half;

means for displacing said sliding members on the respective platen for engaging and releasing the respective projection, selectively, and

further beveled camming surfaces on said members engageable with the said camming surface of the respective flange to press said side of the respective mold half against the respective platen.

2. In an injection-molding machine, an assembly for anchoring a mold half having a projection rigid with and extending from a side of the mold half and formed with a flange transverse to said projection, said assembly comprising:

a platen on said machine provided with a bore adapted to receive said projection; and

gripper means on said platen engageable with said projection for form-locking and force-locking retention thereof on said platen, said gripper means including:

a plurality of sliding members reciprocatingly shiftable on said platen toward and away from an axis of said bore and engageable between said flange and said side of said mold half,

means for displacing said sliding members on said platen for engaging and releasing said projection, selectively, and

camming surfaces on said members engageable with a surface of said flange to press said side of said mold half against said platen.

4,348,166

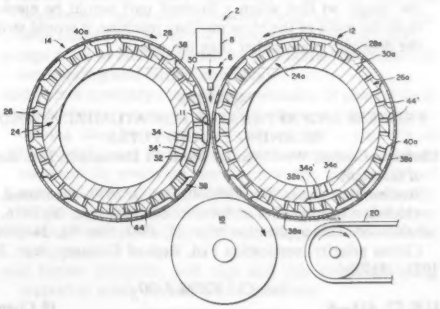
APPARATUS FOR FORMING THIN MATERIALS

David P. Fowler, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Oct. 10, 1980, Ser. No. 195,938

Int. Cl.³ A21C *3/02, 3/10*

U.S. Cl. 425—310 **11 Claims**



1. An apparatus suitable for forming sheet dough material comprising a first rotatable roll and a second rotatable roll positioned to provide a sheet-forming nip therebetween, means for delivering dough for sheeting and cutting to said nip, each of said rolls having means for providing elevated gas pressure from within to the periphery of the roll, said first roll having means for selectively applying pressurized gas from within the roll to its periphery immediately downstream of said nip and positioning the formed sheet on said second roll, cutting means downstream of said nip for cutting the sheet on said second roll into pieces, said second roll having means for selectively applying pressurized gas from within the roll to its periphery downstream of said cutting means to force said pieces away from the outer surface of said second roll.

4,348,167

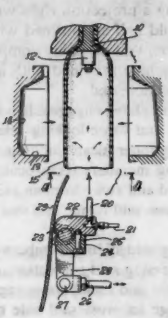
BOTTOM ASSIST PRE-BLOW SYSTEM FOR BLOW MOLDING MACHINES

John J. Virog, Jr., 7502 San Ardo Dr., Buena Park, Calif. 90621

Filed Jan. 26, 1981, Ser. No. 228,098

Int. Cl.³ B29C *17/07;* **B05B** *15/08, 15/10*

U.S. Cl. 425—522 **7 Claims**



1. A device for use in a blow molding machine for improving the control of the shape of a parison positioned into a mold of the blow molding machine, said device comprising:

an air nozzle attached to a pivot carriage which in turn is attached to a pivot shaft moveable between a first and second position, said air nozzle being located at a position near the extremity of the pivot carriage, said pivot carriage thus also being moveable between a first and second position so that the nozzle is positionable directly under a parison when the carriage is in a first position and is moved away from below a parison when the arm is in its second position when a finished part is ejected from the mold; and

a deflector plate attached to said pivot shaft, said deflector plate being positioned so that when the pivot carriage is moved from its first position to its second position, the deflector plate is moved into the location formerly occupied by the nozzle so that when a finished part would be ejected from the mold of the blow molding machine, it would strike the deflector plate rather than the nozzle.

4,348,168

PROCESS AND APPARATUS FOR ATOMIZING AND BURNING LIQUID FUELS

Christian Coulon, Wenckstrasse 56, D 61 Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 839,060, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 678,634, Apr. 20, 1976, abandoned. This application Mar. 17, 1981, Ser. No. 244,580

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517756

Int. Cl.³ F23M *3/00*

U.S. Cl. 431—9 **18 Claims**

9. A method of producing a flame from a burner nozzle providing high combustion efficiency and relatively low amounts of obnoxious constituents comprising the steps of:

(a) introducing primary oxidizing gas into a swirl area of a nozzle having a fuel jet and an outer front wall;

(b) discharging said primary oxidizing gas into said swirl area provided between said outer front wall and an inner wall, said outer front wall having a central aperture,

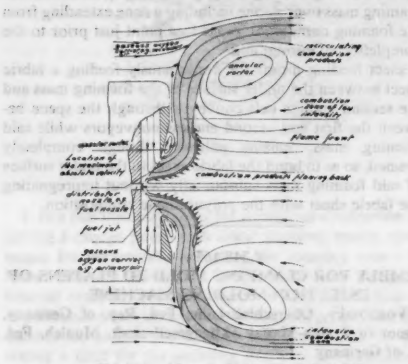
(c) passing the swirl flow of primary oxidizing gas from said swirl area through said central aperture to said outer front wall,

(d) discharging fuel from said fuel jet into a region of approximately maximal flow velocity of the swirl flow of said primary oxidizing gas so that the twist of the swirl flow is such that an annular vortex of said primary oxidizing gas and fuel is formed on a rotationally concentric surface that is inclined with respect to said nozzle,

(e) igniting and forming as a flame a swirling fuel-gas mixture in a corridor adjacent to and adhering to the outer surface of said outer front wall of said nozzle by means of the Coanda effect;

(f) combusting a portion of said swirling fuel-gas mixture in a first stage adjacent said outer front wall surface;

(g) admitting a stream of secondary oxidizing gas to substantially flow around said nozzle,



(h) merging with the partially combusted mixture of said primary oxidizing gas and said fuel to substantially complete the combustion of said swirling fuel-gas mixture in a second stage radially outward from and downstream of said central aperture; and

(i) returning incompletely combusted products of combustion towards a combustion zone represented by said first stage for improving the combustion of said fuel-gas mixture.

4,348,169

CONTROL OF BURNERS

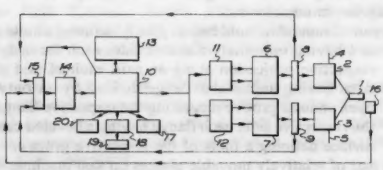
Joshua Swithenbank, and David S. Taylor, both of Sheffield, England, assignors to Land Combustion Limited, Chesterfield, England

Filed May 10, 1979, Ser. No. 37,690

Claims priority, application United Kingdom, May 24, 1978, 22180/78

Int. Cl.³ F23N *5/08, 5/10*

U.S. Cl. 431—89 **13 Claims**



1. Control means for the reactant flow ratio for at least one burner comprising separate valve means for the control of flow of fuel and of air to a burner, a variator associated with each valve for the setting of the position thereof, sensing means associated with each valve for the sensing of the position thereof, a memory device for holding data pertaining to the characteristics of the control means, said memory device having initially stored therein data representing a calculated parameter related to an optimum condition of combustion and data representing control information for the flow of fuel and air to the burner corresponding to said calculated optimum

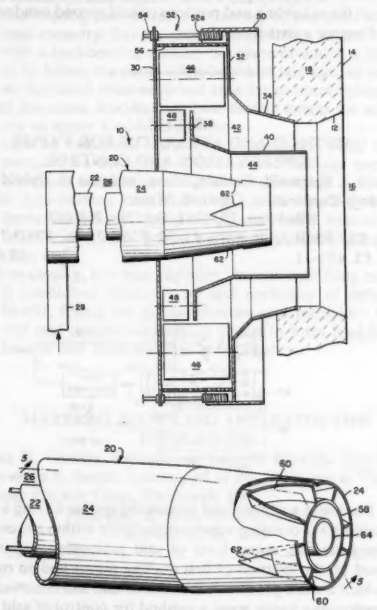
parameter, a computing device for controlling the variators to adjust the positions of said valves in accordance with the calculated data in the memory device, and detector means associated with the or each burner for the detection of the actual value of said parameter related to the optimum condition of combustion, both said sensing and detector means being connected to the memory device, said memory device further including means for continually and automatically up-dating said data stored in the memory to that data which is detected by said detector and sensing means only when the system achieves a condition of combustion which is an improvement over a previously determined optimum condition of combustion, such that the computing device automatically optimises the performance of the control means on the basis of the feedback of information from the said detector means and sensing means.

4,348,170

DUAL REGISTER, SPLIT STREAM BURNER ASSEMBLY WITH DIVIDER CONE

Joel Vatsky, Millburn, and Norman K. Trozzi, West Caldwell, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jun. 4, 1980, Ser. No. 156,309
Int. Cl.³ F23M *9/00*; B05B *1/14*
U.S. Cl. 431—188 **26 Claims**



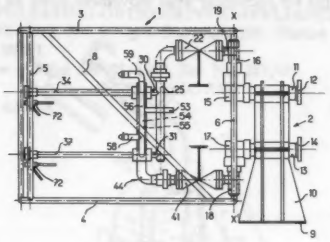
1. A burner assembly comprising means defining an annular passage, means for supplying fuel to said passage, an inlet located at one end of said passage for receiving said fuel, and an outlet located at the other end of said passage for discharging said fuel, means disposed within said annular passage for dividing the stream of fuel passing through said passage into two parallel streams, means for splitting up one of said streams as it discharges from said opening so that upon ignition of said fuel, a plurality of flame patterns are formed, and a register assembly associated with said burner, said register assembly comprising an enclosure extending over said passage for receiving air, and means for directing said air from said enclosure towards said outlet in two parallel paths extending around said passage, and a plurality of vanes respectively disposed in each of said paths for regulating the spin and/or quantity of air flowing through said paths.

4,348,171

APPARATUS FOR BURNING CRUDE OIL

Olivier Issenmann, 4 eme Ave. a, 60260, Lamorlaye, France

Filed Nov. 6, 1979, Ser. No. 91,812
Claims priority, application France, Nov. 6, 1978, 78 31384
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—202 **13 Claims**



1. An apparatus for use in burning crude oil produced in the course of conducting production tests at an oil well drilling installation, said apparatus comprising:

a pedestal adapted to be positioned at a drilling installation;

horizontal conduits extending through said pedestal, said conduits having at first ends thereof means for connection to separate supplies of air, water and crude oil to be burned;

each said conduit having connected to a second end thereof an elbow member having a vertical portion;

each said elbow member having in said vertical portion thereof a revolving coupling pivotally mounted with respect to said elbow member about a vertical axis;

all of said elbow members and said couplings being vertically aligned coaxially of said vertical axis;

a burner assembly fixedly connected to said couplings and horizontally pivotable therewith about said vertical axis with respect to said elbow members and said pedestal;

a cage fixed to and supported by said burner assembly and surrounding said burner assembly;

said burner assembly comprising a plurality of pairs of horizontal burners connected to said elbow members for receiving therefrom crude oil and air, and a plurality of horizontal water nozzles connected to one of said elbow members for receiving therefrom water, said burners of each said pair of burners being vertically spaced, said pairs of burners being horizontally spaced, and each said burner having positioned adjacent thereto a respective one of said water nozzles; and

said burner assembly, said cage and said couplings being supported solely by said elbow members.

4,348,172

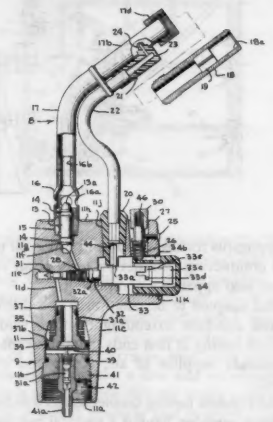
PORTABLE PROPANE GAS HAND TORCH

Harry C. Miller, One Security Dr., Nicholasville, Ky. 40356

Filed Jul. 28, 1980, Ser. No. 172,716
Int. Cl.³ F23Q *7/12*
U.S. Cl. 431—255 **16 Claims**

1. A portable gas hand torch igniter and burner assembly of the piezoelectric-type to be assembled onto a portable pressurized gas fuel cylinder, comprising a handgrip housing body having upper and lower cavities opening through top and bottom wall portions thereof respectively and an interconnecting gas conduit network therebetween, the lower cavity forming an internally threaded gas inlet to be threaded onto the neck of the fuel cylinder for rigidly mounting the housing body

thereon, an elongated burn tube having a venturi portion at its inlet end and an end-tapered orifice cylinder removably mounted in the venturi portion, means removably supporting said venturi portion and orifice cylinder in said upper cavity for rigidly mounting the burn tube on said housing body, a gas pressure regulator valve mechanism adjustably supported in said lower cavity for maintaining a substantially constant predetermined gas supply pressure level at the inlet portion of said gas conduit network, means forming a valve chamber intercepting said gas conduit network having a control valve therein normally closing the conduit network against passage of gas to the burn tube, a push button on the housing body supported for rectilinear axial movement along an axis intercepting the control valve from a normal outward position projecting from the housing body, piezoelectric igniter means in said housing body having a case portion movable along said axis responsive to inward depression of said push button for opening said control valve to admit gas to the burn tube and having a plunger portion movable relative to its case portion responsive to such push button depression to activate the igniter to generate a spark-producing voltage a predetermined short interval after opening of the control valve, an electrode means extending from the igniter to a location within the burn tube near its exit end forming a spark gap with the burn tube for igniting the gas admitted thereto upon opening of said control valve.



4,348,173

SUBMINIATURE PHOTOFLASH LAMP WITH SPACED-APART, LIGHT-EMITTING PYROTECHNIC CHARGES

George J. English, Reading, and John A. Scholz, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 5, 1980, Ser. No. 146,573
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—362 **12 Claims**

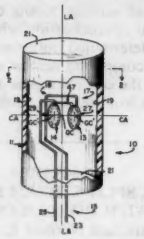
1. A subminiature photoflash lamp comprising:

a light-transmitting envelope;

first and second spaced-apart pyrotechnic charges for emitting light through said envelope upon ignition thereof, each of said charges comprising a primer composition and a fuel mixture and located within said envelope at a preestablished distance from the internal surfaces of the walls of said envelope, said charges being positioned within said envelope relative to each other such that each of said charges assists in the ignition of the other to create a region of the high brightness therebetween;

ignition means for electrically igniting said first and second pyrotechnic charges in a substantially simultaneous manner, said ignition means including first and second electrical conductors secured within said envelope, each of said conductors having an end portion extending within said envelope, said extending end portions electrically coupled to said first and second pyrotechnic charges; and

first and second support means for supporting said first and second pyrotechnic charges, respectively, within said envelope at said preestablished distances from said internal surfaces, said first support means located on the extending end portion of said first electrical conductor or forming a part thereof, said second support means located on the extending end portions of said second conductor or forming a part thereof.

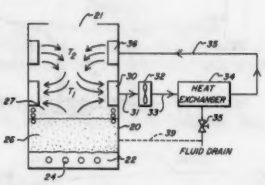


4,348,174

METHOD AND APPARATUS FOR VAPOR CONSERVATION AND CONTROL

Donald J. Spigarelli, Carlisle, Mass., assignor to Hybrid Technology Corporation, Concord, Mass.

Filed Jan. 22, 1981, Ser. No. 228,613
Int. Cl.³ F26B *3/00;* **F27B** *15/00;* **F26B** *21/06;* **F28D** *13/00*
U.S. Cl. 432—1 **18 Claims**



8. For use in a vapor phase processing system having a vessel containing a processing vapor substantially within a processing vapor zone, the upper level of said processing vapor zone defined by the location of first cooling means and an opening by which a work prodcut is introduced into and removed from the processing vapor zone, a method for control of said vapor comprising the steps of:

providing a processing vapor in a processing vapor zone in the vessel disposed in the bottom section of the vessel;

providing a zone in the vessel above the processing vapor zone and below the vessel opening;

exhaust from said vessel at a position above the processing vapor zone and below the opening, air and vapor in the zone above the processing vapor zone;

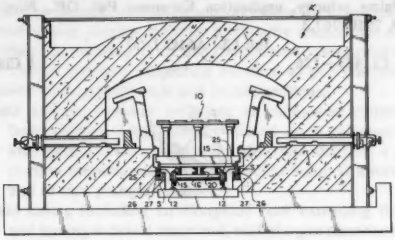
removing from the exhausted air and vapor at least some of the vapor present; and

returning the exhausted air after removal of an amount of vapor to the vessel in the zone above the processing vapor zone and at a position above that at which air and vapor is exhausted.

4,348,175
KILN CAR

Joao F. G. Molina, Jundiai, Brazil, assignor to American Standard Inc., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,504
Int. Cl.³ F27D 1/12; F27B 9/26
U.S. Cl. 432—241 8 Claims



1. A kiln car having a carriage assembly including wheels for transporting the kiln car and product to be fired through a high temperature kiln, said kiln having a bench therein; a dense refractory superstructure of low mass mounted on said carriage assembly, said superstructure comprising:

a load-bearing base of dense refractory of low mass and low heat capacity, having product-supporting means to provide a load-bearing surface, the plane of which is adapted to lie below the plane of the bench of said kiln, to provide an increased cross-sectional area for product firing;

said low-mass, load-bearing base having means for supporting an upper load-bearing base;

a layer of insulating refractory forming a thermal barrier mounted on the upper surface of said carriage assembly, on which said load-bearing base is mounted;

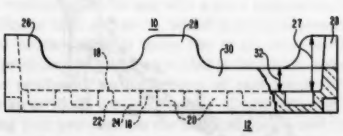
said load-bearing base including a plurality of low-mass, dense, refractory blocks mounted on said insulating refractory and forming a perimeter on said insulating refractory; and

a low density, low heat capacity, thermal-insulating material is positioned interiorly of said perimeter of refractory blocks, filling the spaces between said refractory blocks and said product-supporting means to form load-bearing base of low mass and low heat capacity.

4,348,176
MATERIAL HANDLING APPARATUS FOR INSULATORS

James R. Gamble, Greensburg; Lear C. Herrold, Derry, and Rowland S. Baran, Latrobe, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 2, 1980, Ser. No. 212,283
Int. Cl.³ F27D 5/00
U.S. Cl. 432—258 11 Claims

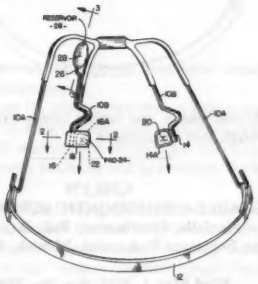


1. Apparatus for supporting ceramic insulator greenware having a mounting portion, a flanged portion and a load bearing surface portion, comprising: support means for supporting said ceramic insulator greenware, said support means including a base having a first surface with at least one recess therein, said recess including a lateral portion and a bottom support portion, said lateral portion providing lateral support for said mounting portion of said ceramic insulator greenware so as to support said ceramic insulator greenware in a predetermined position, said bottom support portion of said recess providing a support surface for said load bearing surface of said ceramic insulator greenware, said recess having a predetermined depth from said first surface of said base selected to position said ceramic insulator greenware so that said flanged portion of said ceramic insulator greenware is above said first surface of said base.

4,348,177
PULSATING ORTHODONTIC APPLIANCE

Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Filed Jul. 27, 1981, Ser. No. 287,493
Int. Cl.³ A61C 7/00
U.S. Cl. 433—5 4 Claims



1. An orthodontic appliance comprising: a bow element adapted to be engaged with a tooth of a patient to apply a pressure to the tooth to move the tooth in a predetermined direction; a liquid reservoir mounted on the bow element; a hollow resilient pad adapted to be mounted on the occlusal surface of a tooth of the patient; and a tubular member coupling the pad to the reservoir to carry liquid from the interior of the pad to the reservoir each time the patient bites to exert a compressive force on the pad so as to cause the bow to transmit a pulse of pressure to the first-named tooth each time the patient removes the compressive force from the pad.

4,348,178
VIBRATIONAL ORTHODONTIC APPLIANCE

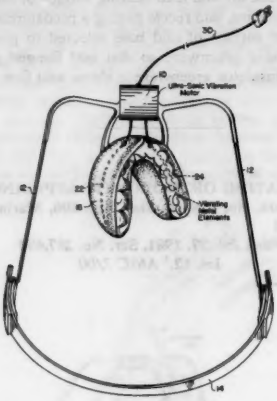
Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Continuation of Ser. No. 756,268, Jan. 3, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,329
Int. Cl.³ A61C 3/00
U.S. Cl. 433—6 4 Claims

1. An active tooth-moving orthodontic appliance for moving teeth that are in maloclusion into corrected positions without clenching, comprising: a resilient tooth positioner mouthpiece containing impressions of the teeth of a patient in corrected position; and means coupled to the mouthpiece for imparting tooth-moving vibrational forces to the mouthpiece to press the teeth that are in maloclusion into the corrected positions, in which said means comprises an ultra-sonic electric motor for introducing vibratory motion to the mouthpiece.

4. An active tooth-moving orthodontic appliance for moving teeth that are in maloclusion into corrected positions without clenching, comprising: a resilient tooth positioner mouthpiece containing impressions of the teeth of a patient in corrected position; and means coupled to the mouthpiece for imparting tooth-moving vibrational forces to the mouthpiece

to press the teeth that are in maloclusion into the corrected positions, in which said means comprises an electrically ener-



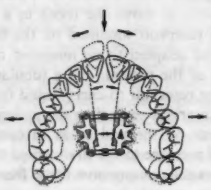
gized hydraulic pump, and rubber tubing extending from said pump through said mouthpiece.

4,348,179

ADJUSTABLE ORTHODONTIC SCREW ASSEMBLY

Alessandro Nardella, Oberhausen, Fed. Rep. of Germany, assignor to Francesco Pedrazzini, Munich, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,579
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—7 **6 Claims**



1. An adjustable orthodontic screw assembly adapted to regulate the position of human teeth comprising:

a two-part extension plate, the separate parts being formed to fit against teeth-supporting gums on opposite sides of one of the jaws, the two parts of the plates being separated and held together by the screw assembly which includes two limbs each secured to one of the extension plate parts and extending along the length of the separation between the plate parts,

means articulating together said limbs at selected first opposed points, second opposed points spaced from the first opposed points on each limb supporting a head member rotatable respectively about parallel axes, each head member being provided with a threaded hole transverse to the axis of rotation with the threads of the threaded holes of the two head members being of opposite hand,

a twin screw having opposed ends oppositely threaded for threaded engagement with the threaded holes of said respective rotatable head members, whereby as the twin screw is rotated in one direction the limbs move apart and as the twin screw is rotated in the opposite direction the limbs move together any relative rotation of the limbs being accommodated by the respective rotatable head members.

4,348,180

DEVICE FOR RELEASABLY CONNECTING A HEAD PART TO A HANDLE PART OF A DENTAL HANDPIECE

Werner Schuss, Heppenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 30, 1980, Ser. No. 202,136
Claims priority, application European Pat. Off., Nov. 29, 1979, 79104767.3
Int. Cl.³ A61C *1/08*
U.S. Cl. 433—126 **5 Claims**

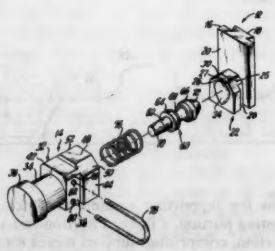
1. A device for releasably connecting a head part having a neck extending from a head housing with a socket for receiving a dental tool to a handle part of a dental handpiece with each part having drive shafts of a drive train extending from the socket in the head housing through the neck and the handle part to a motor in the drive section, said device comprising a radially resilient sleeve-shaped member being disposed on the neck of the head part immediate adjacent to the head housing to form one portion of the outer circumference of the neck of the head part, a pair of catch elements coacting with a pair of counter elements, said sleeve-shaped member acting as means for biasing the catch and counter elements into engagement with each other, each catch element being an outwardly radially projecting catch member disposed on said sleeve-shaped member to be positioned inward of an end of said neck with the catch elements of the pair being diametrically opposite each other, each counter element being a recess adapted to receive the catch member and being disposed on the handle part and aligned with a respective catch element so that said sleeve-shaped member urges said elements into a coupled state and squeezing pressure applied to diametrically opposite portions of said sleeve-shaped member adjacent the catch members enables disengagement of said elements to release the connection between the head and handle parts to enable applying interchangeable head parts on the same handle part.

4,348,181

RETAINING DEVICE FOR A REMOVABLE DENTAL PROSTHESIS

Peter E. Dawson, St. Petersburg, Fla., assignor to Ipco Corporation, White Plains, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,919
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—172 **16 Claims**



1. A retaining device for removably securing a dental prosthesis in position, said device comprising, in combination, a male section for securement to a side of a fixed tooth, and a cooperating female section for securement within the dental

prosthesis, said female section including an elongated casing, said male section including a projecting member receivable in said casing, a spring loaded plunger member disposed in said casing and projecting therefrom, first means within said casing for limiting the extent of longitudinal travel of said plunger member, said male section including securing means for fixedly retaining said male section in place on the fixed tooth, said projecting member including second means for cooperatively receiving said plunger member to thereby anchor the dental prosthesis to the fixed tooth, and third means coacting between said casing and said projecting member to prevent relative rotation between said male and female sections,

said plunger member including an elongated cylindrical body portion, longitudinally spaced apart enlarged first and second collars on said body portion defining a neck portion therebetween, said first collar being at a forward end of said plunger member,

said casing including an elongated bore extending therein and having a closed inner end, said plunger member being disposed in said bore, and a biasing spring being disposed in said bore, said spring being biased between said closed inner end and said second collar,

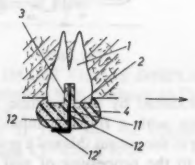
said first means including a restricting member in said casing for engaging both said first and second collars to capture said plunger member within said casing and to limit its longitudinal movement, said restricting member including a wire clip removably inserted through an opening in a side wall of said casing and extending transversely into said bore adjacent said neck portion in a position between said first and second collars.

4,348,182

REINFORCEMENT WIRE FOR MATERIAL FOR THE IMPRESSION OF DECAYED TOOTH

Kazunari Shirota, Tokyo, Japan, assignor to Shirota Denki Kozai Kabushiki-Kaisha, Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,562
Int. Cl.³ A61C *9/00*
U.S. Cl. 433—214 **1 Claim**



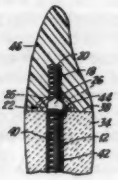
1. A reinforcement for use with a jerry material such as agar agar, silicone resin and so on, which material is pressed over a decayed tooth, which is made flat at its outer surface, and which projects into a hole provided in the tooth, and is solidified for producing an impression of said tooth for joining thereto an artificial tooth by means of said hole and a corresponding post provided on the artificial tooth; said reinforcement comprising a wire body piece and a plurality of short filaments or staple fibers fixed to said piece and projecting radially outwardly therefrom, said filaments or fibers being engaged in the surrounding jerry material when the wire piece is embedded in the jerry material, particularly in the projecting portion thereof which mates with the hole of the decayed tooth, and wherein the wire body piece comprises a stainless steel wire, and the filaments and fibers are made from nylon or rayon fibers which are electrostatic-bonded to the wire.

4,348,183

DENTAL POST PROVIDED WITH A RESTORATIVE MATERIAL RETAINER

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,783
Int. Cl.³ A61C *5/08*
U.S. Cl. 433—221 **3 Claims**



1. A holding device for a dental prosthetic structure, said holding device comprising:

an elongated post for secured insertion within a conformally shaped bore in a tooth stub, said post including securing means on one end portion thereof for coacting with cement for securely retaining said post within the bore in the tooth stub;

said securing means including first external thread means for receiving the cement therein to prevent said post from being pulled out of the bore, said securing means further including first slot means disposed longitudinally along said one end portion of said post and across said first thread means for receiving the cement therein to prevent relative rotation between said post and the tooth stub;

retaining means disposed on the opposite end portion of said post for anchoring dental restorative material of the dental prosthetic structure on the tooth stub, said retaining means including a retaining member provided with a centrally disposed, threaded opening therethrough for receiving said opposite end portion of said post therein;

said opposite end portion of said post including second external thread means coacting with said threaded opening of said retaining member to threadedly secure said retaining member on said opposite end portion of said post;

said post being threaded along its length to define said first and second external thread means;

said retaining member including anchoring means extending outwardly therefrom for securement within the dental restorative material, said anchoring means including a plurality of inwardly directed, upwardly extending tabs, said tabs being spaced apart about said retaining member, said tabs having pointed free end portions, said tabs being an integral part of said retaining member; and

cooperative locking means on said opposite end portion of said post and said retaining member for positionally stabilizing said retaining member with respect to said post to prevent rotation of said retaining member relative to said post, said locking means including second slot means disposed longitudinally along said opposite end portion of said post, said opposite end portion being disposed between said tabs within the dental restorative material, said locking means further including a selected one of said tabs, each of said tabs being deformable to permit entry of said selected one into said second slot means to thereby prevent the rotation of said retaining member with respect to said post;

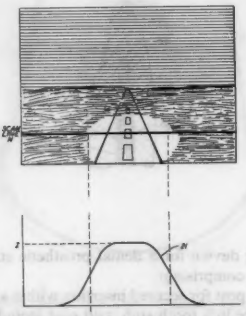
said post including a longitudinally extending slot to define said first and second slot means.

4,348,184

LANDING LIGHT PATTERN GENERATOR FOR DIGITAL IMAGE SYSTEMS

Randy W. Moore, Cupertino, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Nov. 4, 1980, Ser. No. 203,913
Int. Cl.³ G09B 9/08
U.S. Cl. 434—42 **7 Claims**



1. A system for developing a predetermined scene from information obtained from data generated digitally and from data stored electronically, and for displaying said scenes on a display device, comprising:

data storage means for receiving data representative of predetermined scenes,

control means for generating data in order to select a predetermined scene,

a display device connected to receive data from said data storage means and to display scenes selected by said control means,

means connected to said display device to vary the illumination intensity of portions of said displayed scene in accordance with a preselected pattern unrelated to the information in said scene,

an aircraft simulator apparatus having portions to develop information varying in accordance with input provided by a pilot trainee,

a computer-controller circuit,

digital image data processor circuit controlled by information from said computer-controller circuit,

landing lights function generator circuit means comprising counter means connected to said computer-controller circuit to initiate counting depending upon data from said computer-controller circuit,

circuit means to convert the output of said counter circuit means to a log function, and

circuit means to combine said log function output with a position signal from said aircraft simulator in order to control the timing position of said log function output.

4,348,185

WIDE ANGLE INFINITY DISPLAY SYSTEM

Denis R. Breglia, Altamonte Springs, and Alfred H. Rodemann, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1980, Ser. No. 121,553
Int. Cl.³ G09B 9/08
U.S. Cl. 434—43 **9 Claims**

1. A wide angle infinity display system comprising in combination:

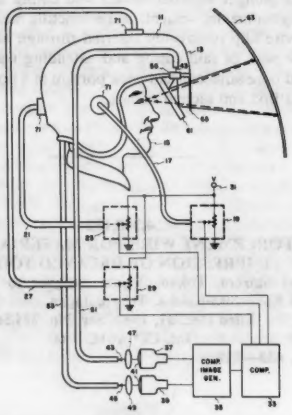
a helmet adapted to be worn upon the head of a trainee pilot;

position monitoring means, having first, second, and third outputs, for sensing the angular movement of the head of said trainee pilot, and for producing pitch, roll, and yaw control signals indicative of such angular movement, said position monitoring means comprising:

first, second, and third potentiometers, each of which has a fixed resistance and a movable arm in slidable contact with said fixed resistance,

a first cable having one end thereof in rotatable engagement with one side of said helmet, and the opposite end thereof connected to the movable arm of said first potentiometer, a second cable having one end thereof in rotatable engagement with the rear of said helmet and the opposite end thereof connected to the movable arm of said second potentiometer, a third cable having one end thereof in rotatable engagement with the top of said helmet and the opposite end thereof connected to the movable arm of said third potentiometer, and a direct current voltage source having an output connected to the fixed resistance of said first, second, and third potentiometers;

computing means having first, second, and third inputs respectively connected to the first, second, and third outputs of said position monitoring means, and an output adapted for processing the pitch, roll, and yaw control



signals produced by said position monitoring means in accordance with a flight simulation program, and for providing at the output thereof a position control signal in response to the processing of said pitch, roll, and yaw control signals by the flight simulation program of said computing means;

image producing means having an input connected to the output of said computing means for generating visual information, the visual information generated by said image producing means to be oriented in accordance with the angular movement of the head of said trainee pilot in response to the position control signal provided by said computing means; image forming means mounted upon said helmet and secured thereto adapted for projecting upon a retroreflective screen the visual information provided by said image producing means so as to form upon said screen a visual scene to be observed by said trainee pilot; and

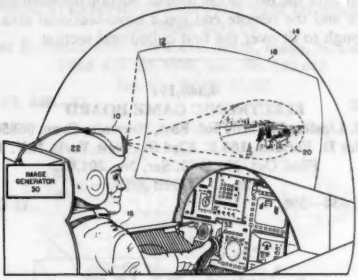
multiple path communicating means positioned between said image producing means and said image forming means for transmitting therebetween the visual information by said image producing means.

4,348,186

PILOT HELMET MOUNTED CIG DISPLAY WITH EYE COUPLED AREA OF INTEREST

James F. Harvey, Maitland; Walter S. Chambers, Orlando, and John J. Kulik, Longwood, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1979, Ser. No. 104,521
Int. Cl.³ G09B 9/08
U.S. Cl. 434—44 **11 Claims**



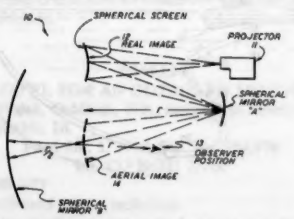
1. A display system adaptable as a training device that has the capability of imaging a scene in motion which is responsive to the actions of a trainee and which substantially matches the visual acuity of the human eye with the resolution of the image such that level of detail is allocated by priority to the area of interest then being observed by the trainee, comprising a sight line tracker, display means at least partially within the visual field of view of said trainee for presenting an observable scene of image information coupled thereto, computing means coupled to said tracker for ascertaining the orientation of the trainee's line of sight with respect to said display means, and means coupled to said computing means for electronically generating and providing image information for said display means from stored data by correlating said ascertained line of sight to said scene and allocating image detail in a predetermined hierarchy of resolution about said area that is being observed by said trainee as determined by said ascertained line of sight, whereby said hierarchy of resolution progressively decreases about said line of sight.

4,348,187

AERIAL IMAGE VISUAL DISPLAY

Martin Dotsko, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,091
Int. Cl.³ G09B 9/08
U.S. Cl. 434—44 **9 Claims**



1. In a simulator training apparatus having an optical visual display to develop a realistic aerial image, said visual display comprising:

a first concave spherical mirror positioned to focus a predetermined visual scene as an aerial image located a distance from said first mirror equal to its radius,

a second concave spherical mirror positioned on the opposite side of said aerial image from said first mirror and located a distance from said aerial image equal to one-half its radius, so that its concave mirror surface can focus at infinity said predetermined visual scene focused by said first spherical mirror as said aerial image,

means to project said predetermined visual scene for focusing by said first concave spherical mirror as an object for said second concave spherical mirror,

an observer's position facing said second concave spherical mirror and contiguous with the center of curvature,

said first concave spherical mirror is located above and behind said observer's position, and

said observer's position is located contiguous to a line from said center of curvature to the center of said second concave spherical mirror,

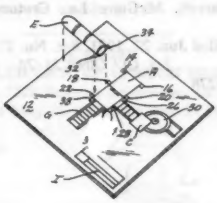
whereby an aerial image of a projected visual scene is developed and functions as an object to develop an infinity virtual image which is visible at said observer's position.

4,348,188

PLAYGROUND DESIGN KIT AND METHOD OF USING THE SAME

Paul W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Feb. 5, 1981, Ser. No. 231,863
Int. Cl.³ G09B 29/00
U.S. Cl. 434—72 **11 Claims**



1. A method of designing an outdoor playground complex comprising:

projecting selected views of interchangeable components of said complex onto two dimensions in reduced scale, including the display of the significant features of said components visible in said view;

transposing said views onto a substantially transparent material adapted to releaseably adhere to substantially smooth, dry, clean surfaces;

cutting templates out of said material which follow the outline of said views;

securing selected templates in a proposed arrangement to a surface adapted to releaseably adhere to said material;

removing said templates from said surface; and

repositioning said templates in further proposed arrangements;

whereby said components can be variously arranged to form a scale plan of a desired complex.

4,348,189

METHOD FOR READING TYPING AND SPACING ERRORS

Michael L. Sapp, Santa Maria, Calif. 93454

Continuation-in-part of Ser. No. 879,074, Feb. 21, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 99,202
Int. Cl.³ G09B 13/00
U.S. Cl. 434—227 **2 Claims**

1. A method for determining typing errors comprising preparing of a master sheet having a legend thereon of simulated

type characters at selected spacing and margins, preparing on a transparent sheet the same legend in simulated type characters and in ink of one color, placing the characters on the transparent sheet in the same selected spacing and margins as appearing on the master sheet, typing on a test page in type corresponding to that of the transparent sheet but in ink of a contrasting second color the same legend material and at the same selected spacing and margins as appearing on the master sheet, superimposing the transparent sheet on the test page

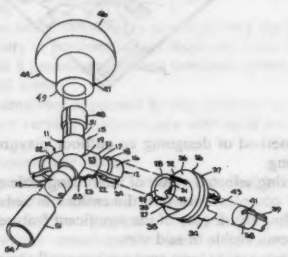
with characters matched as to spacing and margins and then tabulating exposed spots of characters of the second color which are visible adjacent corresponding characters of the first color, perforating the transparent sheet with a series of laterally spaced holes at substantially equal intervals, numbering the holes successively as speed intervals, imprinting the test page through a hole at the end of the typed legend and marking the imprint with the corresponding number to indicate time consumed in typing the legend.

4,348,190

INTERLOCKING MOLECULAR MODEL SYSTEM

Edward J. Barrett, McGuire La., Croton-on-Hudson, N.Y. 10520

Filed Jun. 22, 1981, Ser. No. 276,180
Int. Cl.³ G09B *23/26*
U.S. Cl. 434—278 **17 Claims**



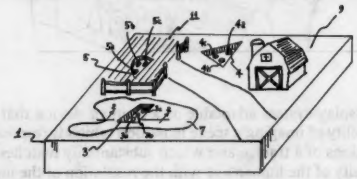
1. An interlocking molecular model system comprising:
a first component representative of an atom and including at least one elongated shank extending outwardly from a part of the component representing the nucleus of the atom, the shank having
a first cylindrical section of one cross sectional area at its outer end,
a second cylindrical section of smaller cross-sectional area adjacent the end of the first cylindrical section facing the part of the component representing the nucleus, the surface of the shank between the first and second cylindrical sections defining a shoulder extending inwardly from the surface of the first cylindrical section, and
an abutment extending transversely outwardly relative to the axial direction of the second cylindrical section and adjacent the end of the second cylindrical section closer to the part of the component representing the nucleus; and
a fastener component comprising a hollow tubular portion longitudinally slotted at one end and having an axial length representative of a predetermined portion of a covalent radius of the atom, the inner surface at one end of the slotted end portion comprising an inwardly extending axial lock fitting over the second cylindrical section of the first component to be hooked behind the shoulder on the shank and having an axial length substantially equal to the axial length of the second cylindrical section, whereby the fastener component can be axially interlocked with the shank so that the distance between the part of the first component representing the nucleus and the remote end of the tubular portion of the fastener component is representative of the covalent radius of that atom, and the inner surface of the part of the tubular portion between the axial lock and the remote end has a cross-sectional area large enough to fit over the first cylindrical section.

4,348,191

ELECTRONIC GAME BOARD

Barry R. Lipsitz, 44 Purdy Rd. East, Norwalk, Conn. 06850, and Charles D. Forman, 164 E. 83rd St., New York, N.Y. 10028

Filed Oct. 29, 1980, Ser. No. 201,922
Int. Cl.³ G09B *5/06*
U.S. Cl. 434—308 **11 Claims**



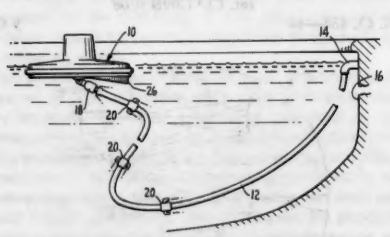
1. Game board apparatus comprising:
a plurality of articles each representative of a different entity;
a board having at least one receptacle adapted to interchangeably receive at least two of said articles;
sound generating means for producing a plurality of sounds; and
switch means, coupled to said sound generating means and responsive to the placement of articles in said receptacle, for causing said sound generating means to produce different sounds for different articles placed in said receptacle.

4,348,192

AUTOMATIC POOL CLEANER

Andrew L. Pansini, Belvedere, Calif., assignor to Jandy Industries, Inc., San Rafael, Calif.

Filed Feb. 23, 1981, Ser. No. 236,774
Int. Cl.³ B64C *21/06*; B08B *3/02, 9/08*
U.S. Cl. 440—38 **8 Claims**



1. In an automatic pool cleaner comprising a transporter adapted to rollingly engage pool side walls, a drive jet nozzle for the transporter having a pivotal connection therewith whereby said nozzle may drive said transporter randomly about a pool, a water supply hose connected to said nozzle, and jet driving means for the supply hose operable when said

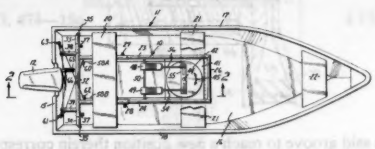
transporter is slowed along a forward line of direction to re-orient said drive jet nozzle and drive said transporter along a rearward line of direction: the provision in combination therewith of means carried by said transporter operable due to the turning of said transporter as it travels in rolling engagement with a pool side wall to slow said transporter in its direction of movement and re-orient said drive jet nozzle to drive said transporter in the opposite direction along said pool wall.

4,348,193

FOOT STEERING APPARATUS FOR OUTBOARD MOTOR BOATS

Walter E. Arndt, 1713 Third Ave. South, Fargo, N. Dak. 58102

Filed Apr. 25, 1980, Ser. No. 143,645
Int. Cl.³ B63H *25/02*
U.S. Cl. 440—62 **20 Claims**



1. A foot operable steering apparatus to steer a boat equipped with an outboard motor mounted on a transom at the back of the boat and rotatable about a generally upright axis for purposes of steering the boat, said steering apparatus comprising:

frame means locatable on the floor of the boat;

a turntable secured with respect to the frame means forward of said motor and rotatable about a generally upright axis;

a steering cable trained around the turntable and having ends extending tangentially from either side of the turntable rearwardly therefrom and connected to the motor whereby rotation of the turntable in one direction rotates the motor in one direction to turn the boat in one direction, and rotation of the turntable in the opposite direction rotates the motor in the opposite direction to turn the boat in the opposite direction; and

first and second foot pedals connected to the frame means and connected to the turntable on opposite sides of the axis of rotation of the turntable, said foot pedals each having a rearward end pivotally connected to the frame means for rotation about a generally horizontal axis, a first foot pedal connecting link connected to the forward end of the first foot pedal at one end and connected at the opposite end to said turntable, and a second foot pedal connecting link connected at one end to the forward end of the second foot pedal and connected at the other end to the turntable on the opposite side of the axis of rotation with respect to the first foot pedal connecting link whereby operation of one foot pedal is effective to rotate the turntable in one direction and operation of the other foot pedal is effective to rotate the turntable in the opposite direction.

4,348,194

COWL FOR AN OUTBOARD MOTOR

James R. Walsh, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 1, 1980, Ser. No. 164,976
Int. Cl.³ B63H *21/00*
U.S. Cl. 440—77 **8 Claims**

1. An outboard motor including:

(A) a drive shaft housing;

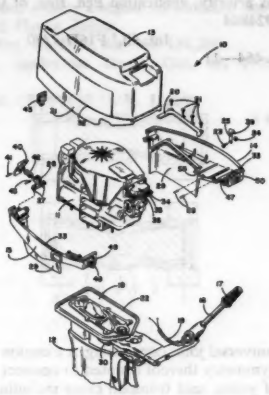
(B) an engine supported on said drive shaft housing; and

(C) a cowl assembly surrounding said engine, said cowl assembly comprising:

(1) a first bottom cowl member,

(2) a second bottom cowl member, said bottom cowl members fitting together around said drive shaft housing below said engine,

(3) a top cowl member joined with said bottom cowl members to enclose said engine, and



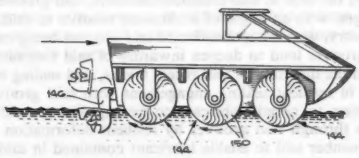
(4) a latch means to hold said cowl members together, said latch means comprising a bracket attached to both of said bottom cowl members.

4,348,195

MULTIPLE STEP VENTED HULL

George H. Lantz, 7520 Rovena, Anchorage, Ak. 99502

Filed May 10, 1979, Ser. No. 37,818
Int. Cl.³ B63H *1/38*
U.S. Cl. 440—100 **2 Claims**



1. An all-terrain vehicle for high speed travel on water, comprising:

a plurality of broad flotation wheels, each of which is a flotation body;

a plurality of steps on the surface of each said flotation body, said steps being angled toward the center of said body from the front to the rear thereof; and each said step being sloped downward and to the rear;

means for venting the rear surface of each said step to the atmosphere, said means including lateral extension of each step to one of the sides of said body to a point above the normal water line when said flotation body is stationary, said extensions angling forward along the sides of said body and terminating in a curving arc extending forward substantially parallel to the surface of the water when said steps are in the water and said structure is moving forward; and

means for driving said body through the water with sufficient speed to progressively raise said body up onto the steps so that there is progressively reduced contact between said flotation body and the water as the speed is increased.

4,348,196

UNIVERSAL JOINT

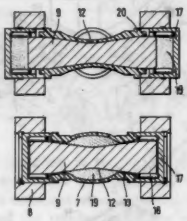
Werner Krude, Siegburg-Kaldauen, and Peter Harz, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,253

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924844

Int. Cl.³ F16D *3/40*

U.S. Cl. 464—11 **3 Claims**



1. A universal joint comprising: a trunnion cross defining an axis of symmetry thereof adapted to connect the yoke arms of a pair of yokes, said trunnion cross including trunnion members having arranged thereon bearing means adapted to be received in bores of said yoke arms; a continuous resilient seal member loosely extending over the body of said trunnion cross which also acts as a seal for said bearing means and is constructed as a contact seal, said trunnion cross being constructed in such a way that a lubricant supply is arranged between said trunnion cross and said seal member; recess means formed in said trunnion cross for containing therein a supply of lubricant, said recess means being formed with a greater depth at the center portion thereof, said center portion being spaced closer to the axis of symmetry of said trunnion cross than peripheral areas of said recess means surrounding said center portion; and grooves extending in the longitudinal direction of said trunnion members from said peripheral areas of said recess means toward the ends of said trunnion members, said grooves being arranged with an angle of inclination relative to said axis of symmetry, with the inclination of said grooves being such that said grooves tend to deepen inwardly of said trunnion members in the direction of said recess means, said sealing member being in resilient sealing engagement with said grooves and operating to permit lubricant to be supplied to said recess means through said grooves by resilient deformation of said seal member and to enable lubricant contained in said recess means to effect lubrication of said bearing means through said grooves, said flow of lubricant being enhanced by the inclined orientation of said grooves.

4,348,197

TORQUE-SENSING PULLEY AND DRIVE SYSTEM

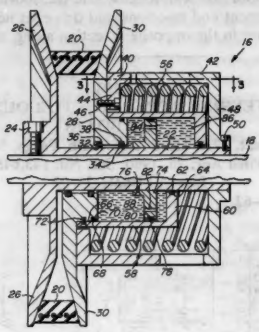
Larry R. Oliver, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 28, 1980, Ser. No. 115,599

Int. Cl.³ F16H *11/04*

U.S. Cl. 474—28 **10 Claims**

1. In a torque-responsive variable diameter V-belt pulley comprising, a first central cylindrical sleeve having a first V-belt engaging pulley section extending from one end thereof, means for fixedly mounting said first sleeve and first pulley section on a rotary shaft, a second cylindrical sleeve having a second V-belt engaging pulley section extending therefrom and having a cylindrical shoulder, said second cylindrical sleeve and second pulley section being mounted over said first sleeve for free rotation relative thereto and axial translational movement thereon so that said second section is movable relative to said first section, said sections defining a V-belt groove therebetween, means for urging said second section toward said first section, torque-responsive contact pressure means for controlling the axial spacing between said pulley sections in response to a change in the load being transmitted by a V-belt in said groove which results in relative rotation of said sections, said torque-responsive means operating to adjust the distance between said sections and allow the



belt in said groove to reach a new position therein corresponding to the new load, and damping means for preventing sudden change in said axial spacing of said pulley sections, the improvement wherein said damping means comprises an integral fluid-operated shock absorber which has an integral fluid chamber comprised of portions of both of said sleeves.

4,348,198

BICYCLE DERAILLEUR HAVING A REDUCED LATERAL WIDTH

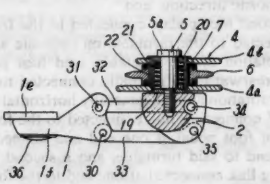
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 21, 1980, Ser. No. 142,380

Claims priority, application Japan, May 4, 1979, 54-59801[U]

Int. Cl.³ F16H *7/22*

U.S. Cl. 474—82 **9 Claims**



1. A derailleur for a bicycle for guiding a driving chain axially of a plurality of sprockets forming a multi-stage sprocket assembly so as to switch said chain to a selected one of said sprockets for changing speed, said derailleur comprising:

a fixing member;

a supporting member supported to said fixing member and movable with respect thereto;

a change-over frame supported swingably to said supporting member through a first horizontal shaft, said change-over frame having at least one side plate;

a second tubular shaft arranged co-axially with said first shaft, said second shaft being fixed to one of said supporting member and change-over frame, the inner periphery of said second shaft and the outer periphery of said first shaft forming a tubular spring housing chamber;

a coiled tension spring housed within said spring housing chamber, said spring being retained at one end to a side of said change-over frame and at the other end to a side of said supporting member;

a first pulley supported rotatably to the outer periphery of said second shaft, the axial length of said first pulley being substantially equal to that of said first and second shafts; and,

a second pulley supported rotatably to said change-over.

4,348,199

BUFFER DEVICE FOR A ROLLER CHAIN AND SPROCKET COUPLING

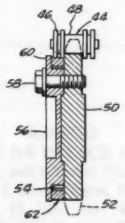
Koichiro Oonuma, Shiki; Yoshinori Kawashima, Sakado, and Toshinori Hanai, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,892

Claims priority, application Japan, Oct. 4, 1979, 54-136728[U]

Int. Cl.³ F16H 9/00, 55/30

U.S. Cl. 474—156 **4 Claims**



1. A buffer device for a roller chain and sprocket coupling comprising a circular, peripheral groove coaxially arranged with the sprocket and adjacent the teeth thereof and a buffer ring positioned in said groove, said buffer ring including an outside resiliently compressible ring and an inside leaf spring concentrically arranged together, the inside diameter of said buffer ring being larger than the outside diameter of the bottom of said groove and the sum of the outside diameter of the bottom of said groove and twice the radial thickness of said buffer ring being greater than the inside diameter of the inscribed circle of the link plates of the portion of the roller chain engaged with the sprocket.

4,348,200

MULTI-SPEED SPROCKET ASSEMBLY FOR A BICYCLE

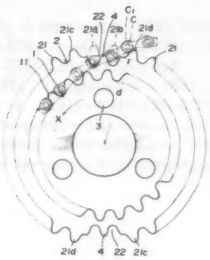
Masao Terada, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Sep. 18, 1980, Ser. No. 188,296

Claims priority, application Japan, Oct. 11, 1979, 54-141001[U]

Int. Cl.³ F16H 55/30, 11/08

U.S. Cl. 474—160 **5 Claims**



1. A multi-speed sprocket assembly for a bicycle, comprising at least two sprockets and connectors for connecting said sprockets axially at a given interval, one of said sprockets being a smaller diameter sprocket having a smaller number of teeth than that of a remaining of said sprockets, said remaining sprocket having a larger diameter with a larger number of teeth than that of said one sprocket, said larger diameter sprocket having at least two teeth omitted from a plurality of teeth of said larger diameter sprocket, and being provided between teeth which are adjacent to said omitted teeth with a recess which is directed radially inwardly of said larger diameter sprocket from the dedendum circle thereof, and at an intermediate portion of said recess corresponding to a bottom land between said omitted teeth a projection extending close to said dedendum circle is provided.

4,348,201

TANNING PROCESS AND TANNING COMPOSITIONS

Saburo Hayashi, Kakogawa; Syohiti Okada, Kobe; Kazuyoshi Okamoto, Hyogo; Mochifumi Mizutani, Himeji; Teizo Isono, Kakogawa; Toshio Osada, Himeji; Tohru Okabe, Hyogo, and Mitsuji Adachi, Himeji, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed May 7, 1980, Ser. No. 147,663

Claims priority, application Japan, May 11, 1979, 54/58488; Apr. 17, 1980, 55/51323

Int. Cl.³ C14C *1/04, 3/06*

U.S. Cl. 8—94.18 **27 Claims**

1. A pretanning process comprising pickling a hide which has previously been subjected to beamhouse works, in the presence of hexamethylene-tetramine, an acid selected from the group consisting of sulfuric acid and a mixture of sulfuric and formic acid and at least one tanning improver selected from the group consisting of chromium salts and aluminum salts.

4,348,202

HAIR DYE OR BLEACH SUPPORTS

Jean-Francois Grollier, and Chantal Fourcadier, both of Paris, France, assignors to L'Oreal, Paris, France

Filed Jun. 10, 1980, Ser. No. 158,271

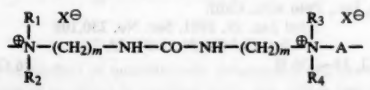
Claims priority, application France, Jun. 15, 1978, 78 17899; Belgium, Jun. 14, 1979, 195.741; Italy, Jun. 14, 1979, 68281 A/79; Switzerland, Jun. 14, 1979, 5592/79; Canada, Jun. 15, 1979, 329838; Fed. Rep. of Germany, Jun. 15, 1979, 2924230; Japan, Jun. 15, 1979, 54-75560; United Kingdom, Jun. 15, 1979, 7920878; France, Dec. 13, 1979, 79 30586

The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.³ A61K *7/06*

U.S. Cl. 8—406 **47 Claims**

1. A hair dye composition free of an anionic polymer comprising an oxidation hair dye present in an amount effective to dye hair and a dye support therefor, said dye support comprising at least one polymer having units of the formula



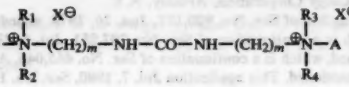
wherein R_1, R_2, R_3 and R_4, each independently represent alkyl having 1–20 carbon atoms, hydroxyalkyl having 1–20 carbon atoms, cycloalkyl having 5 or 6 carbon atoms in the ring, alkyl substituted cycloalkyl having 5 or 6 carbon atoms in the ring and wherein the total number of carbon atoms is less than 20 and phenylalkyl wherein the alkyl moiety has 1–3 carbon atoms, or one or both of the pairs R_1 and R_2, and R_3 and R_4, together with the nitrogen atom to which each of said respective pairs is attached, form a ring having 2–6 carbon atoms or a ring having 2–6 carbon atoms and a heteroatom other than nitrogen;

$X^{\ominus}$ is an inorganic or organic acid anion;

m is 2 or 3; and

A represents linear or branched alkylene or alkenylene having 2–18 carbon atoms, linear or branched alkylene or alkenylene having 2–18 carbon atoms and substituted by one or more of —OH or =O groups, or linear or branched alkylene or alkenylene having 2–18 carbon atoms and interrupted by one or more of oxygen, sulfur, nitrogen or phenylene groups.

13. A hair dye composition free of an anionic polymer comprising an oxidation hair dye present in an amount effective to dye hair and a dye support therefor, said dye support comprising at least one polymer having the units of the formula



wherein

R_1=R_2=R_3=R_4=CH_3 or C_2H_5;

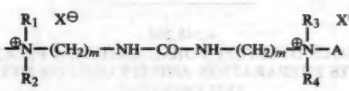
X=Cl

m=3; and

when R_1-R_4=CH_3, A represents —CH_2CH_2O—CH_2CH_2—, —CH_2—C_6H_4—CH_2—, —CH_2—CHOH—CH_2—, —$(CH_2)_6$— or —CH_2—CH=CH—CH_2—, and

when R_1-R_4=C_2H_5, A represents —$(CH_2)_6$—, —CH_2—CHOH—CH_2— or —CH_2—CH=CH—CH_2—.

22. A hair dye composition free from an anionic polymer in cream form comprising an oxidation hair dye present in an amount effective to dye hair, at least one polymer having units of the formula



wherein

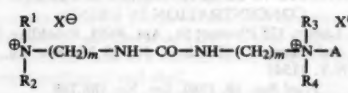
R_1=R_2=R_3=R_4=CH_3 or C_2H_5;

X is Cl;

m is 3; wherein

when R_1—R_4=CH_3, A represents —CH_2—CH_2—O—CH_2—CH_2—, —CH_2—C_6H_4—CH_2—, —CH_2—CHOH—CH_2—, —$(CH_2)_6$— or —CH_2—CH=CH—CH_2— and when R_1—R_4=C_2H_5, A represents —$(CH_2)_6$—, —CH_2—CHOH—CH_2— or —CH_2—CH=CH—CH_2—; and at least one of a C_{12} to C_{20} fatty acid soap or a C_{12} to C_{20} fatty alcohol in the presence of a nonionic emulsifier.

33. A hair dye composition free from an anionic polymer in gelable liquid form comprising an oxidation hair dye present in an amount effective to dye hair, at least one polymer having units of the formula



wherein

R_1=R_2=R_3=R_4=CH_3 or C_2H_5;

X is Cl;

m is 3; wherein

when R_1—R_4=CH_3, A represents —CH_2—CH_2—O—CH_2—CH_2—, —CH_2—C_6H_4—CH_2—, —CH_2—CHOH—CH_2—, —$(CH_2)_6$— or —CH_2—CH=CH—CH_2—, and when R_1—R_4=C_2H_5, A represents —$(CH_2)_6$—, —CH_2—CHOH—CH_2— or —CH_2—CH=CH—CH_2—; and

(a) a mixture of an oxyethylenated or polyglycerolated nonionic compound and a solvent or

(b) a mixture of a liquid fatty acid soap and a solvent.

4,348,203

DYEING PROCESS

James K. Skelly, Wilmslow; David G. Evans, Rochdale, and Barrie Broadbent, Stockport, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 920,107, Jun. 26, 1978, abandoned, which is a continuation of Ser. No. 702,551, Jul. 6, 1976, abandoned, which is a continuation of Ser. No. 465,046, Apr. 29, 1974, abandoned. This application Jul. 7, 1980, Ser. No. 166,628

Claims priority, application United Kingdom, May 5, 1973, 21529/73; Switzerland, Mar. 5, 1974, 9723/74

Int. Cl.³ D06P *1/16, 1/64, 5/00*

U.S. Cl. 8—501 15 Claims

1. A process for dyeing synthetic textile fibers consisting essentially of the steps of contacting said fibers at ambient temperature with a water-insoluble dyestuff in a two-phase liquid system in the substantial absence of a dispersing agent, said two-phase liquid system consisting essentially of a minor amount of an active solvent excluding chlorinated aliphatic hydrocarbons in admixture with the necessary amount of water to produce said two-phase liquid system, and subsequently rapidly raising the temperature for fixation of the dye, the active solvent under the conditions of dyeing being liquid, a solvent for the dye and only slightly soluble or insoluble in water and the fixation affinity of the fiber for the dye being greater than that of the active solvent for the dye at the temperature required for fixation.

4,348,204

AQUEOUS DYESTUFF FORMULATION, A PROCESS FOR ITS PREPARATION AND ITS USE FOR DYEING AND PRINTING

Wolfgang Bauer, Maintal; Heinz Dickmanns, Frankfurt am Main; Konstantin Morgenroth, Maintal; Kuno Reh, Frankfurt am Main, and Joachim Ribka, Offenbach-Bürgel, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 112,541, Jan. 16, 1980, abandoned. This application Apr. 1, 1981, Ser. No. 249,955

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902034

Int. Cl.³ D06P *67/00*; C09B *67/00*

U.S. Cl. 8—527 8 Claims

1. Aqueous dyestuff solution of a tetrakisazo direct dyestuff which is stable to alkali and contains at least one aromatic hydroxyl or enol group and at least two groups conferring solubility in water, or a mixture of such azo direct dyestuffs, said solution having a pH value of at least 12, and a dyestuff concentration of 5 to 50% by weight.

4,348,205

MEASURING BETA-HYDROXYBUTYRATE CONCENTRATION IN URINE

Stuart A. Lipton, 125 Pleasant St., Apt. #601, Brookline, Mass. 02146, and James V. Manzione, Jr., 38 Meadow La., Glen Head, N.Y. 11545

Filed Sep. 19, 1980, Ser. No. 188,749

Int. Cl.³ G01N *33/64*

U.S. Cl. 23—230 B 4 Claims

1. A process of measuring beta-hydroxybutyrate in a urine sample consisting essentially of

providing said urine sample free of any additions of acid solutions,

mixing hydrogen peroxide with said urine sample,

heating said urine and hydrogen peroxide mixture at a temperature of about 100° C. for a period of time sufficient to vaporize all of any acetone/acetoacetate originally present in said sample and to oxidize beta-hydroxybutyrate in said sample to acetone/acetoacetate,

cooling said mixture, and

measuring the acetone/acetoacetate concentration using the nitroprusside test, said concentration being a measure of said beta-hydroxybutyrate originally present in said urine sample.

4,348,206

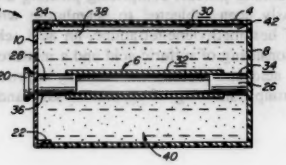
SLURRY PIPELINE SIMULATION METHOD

Avtar S. Sandhu, Tiburon, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Nov. 3, 1980, Ser. No. 203,775

Int. Cl.³ G01N *33/22, 33/24*

U.S. Cl. 23—230 A 10 Claims



1. A method for simulating the effect upon a first slurry, comprising a mixture of solid particulates and a liquid, after it has passed through a pipeline, comprising the following steps:

providing a test slurry comprising a test liquid and test solid particulates;

providing a closed, horizontally disposed drum, said drum having a circular cross-sectional shape, an inside surface and mounted for rotation about its axis, a pipeline simulation surface mounted within and generally along the axis of said drum, and door means for introducing said test slurry within said drum;

adding said test slurry to said drum;

rotating said drum for a predetermined time; and

analyzing said test slurry after being rotated whereby the expected effect upon said first slurry after passing through said pipeline is determined.

2. The method according to claim 1 wherein said test slurry is a coal-water slurry.

4,348,207

METHOD AND MEANS FOR DETERMINATION OF PREGNANCY

Leona R. Cappel, Norco, Calif., assignor to Cooper Laboratories, Inc., Palo Alto, Calif.

Filed Jan. 29, 1981, Ser. No. 230,108

Int. Cl.³ G01N *33/54, 33/76*

U.S. Cl. 23—230 B 16 Claims

1. A process for diagnosing pregnancy in humans comprising

providing a test container including a dry reaction mixture comprising HCG sensitized particles and an anti-serum of HCG, said test container having an interior surface, at least, which is non-wettable to urine or a diluting liquid therefor and further having an interior diameter of sufficient dimension to support capillary action of the urine or diluting liquid when contained therein,

adding a predetermined amount of urine from a subject

being tested to the test container and mixing the urine with the reagent contained therein,

allowing the mixture to stand in the container in an upright position for from about ½ hour to 2 hours,

inverting the container and inspecting the contents thereof for evidence of an agglutination reaction or inhibition thereof.

4,348,208

URIC ACID ASSAY AND REAGENT SYSTEM THEREFOR

Robert L. Long, Indianapolis, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed Oct. 26, 1981, Ser. No. 315,165
Int. Cl.³ G01N *33/52*
U.S. Cl. 23—230 B **18 Claims**

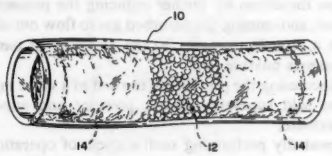
1. In a method for the determination of uric acid in a fluid sample wherein said sample is reacted with phosphotungstate under alkaline conditions, the improvement comprising the step of accelerating the reaction between uric acid and phosphotungstate by including in the reaction mixture thereof at least one sulfhydryl-containing compound in an amount substantially greater than that endogenously present in said sample, thereby increasing the sensitivity and specificity of the reaction for uric acid.

4,348,209

DETERMINING QUANTITATIVE DEGREE OF ETHYLENE OXIDE EXPOSURE IN STERILIZATION PROCESSES

J. Barry Murtaugh, Barrington; Dean G. Laurin, Lake Zurich, both of Ill.; John E. Kling, Dallas, Tex., and Archie G. Woodworth, Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 25, 1981, Ser. No. 305,418
Int. Cl.³ G01N *31/04, 31/10*
U.S. Cl. 23—232 R **15 Claims**



1. The method of quantitatively determining the amount of exposure of an object to ethylene oxide gas, which comprises:

placing adjacent to said object a preweighed ethylene oxide-permeable container which encloses a predetermined amount of catalyst for the reaction of ethylene oxide to form a liquid, said container being impermeable to said catalyst and liquid;

exposing said object and container to ethylene oxide gas for a controlled time and at a determined temperature; and

reweighing said container, whereby the weight gain of said container is a quantitative indication of the amount of exposure to ethylene oxide gas.

4,348,210

NOVEL PROCESS AND PRODUCT

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,814
Int. Cl.³ C10L *1/02*
U.S. Cl. 44—56 **14 Claims**

1. A composition comprising:

(i) a water-soluble alcohol; and

(ii) an effective corrosion-inhibiting amount, of 0.25–25 pounds per thousand barrels of alcohol, of the reaction product of a maleic anhydride and

$$C_aH_{2a+1}—O—C_bH_{2b}NH_2$$

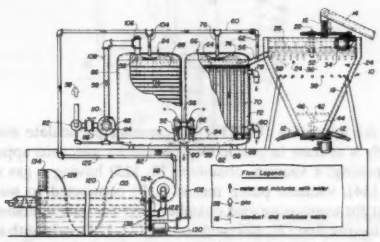
wherein a is an integer greater than 5, b is an integer greater than 2, and C_bH_{2b} is a straight chain alkylene group.

4,348,211

GAS GENERATING SYSTEM

Edwin H. Zimmerman, R.D. #1, New Holland, Pa. 17557

Filed Feb. 6, 1981, Ser. No. 231,987
Int. Cl.³ C10J *3/30, 3/32*
U.S. Cl. 48—76 **15 Claims**



1. A system to generate gas products having useful B.T.U. values from waste cellulosic material capable of being sintered and charred and comprising in combination:

a. a conical metallic generator shell positioned vertically and tapering downwardly to material inlet means in the bottom thereof,

b. a closure for the top of said generator shell to form with the walls of the shell a gas accumulating chamber in the upper portion of said shell,

c. means to feed waste material progressively into said inlet means for progressive movement upwardly in said shell from the lower portion thereof,

d. controlled air inlet ports spaced circumferentially around said generator shell adapted to form a sintering type combustion zone within waste material in the upper portion of said shell below said gas accumulating chamber,

e. gas outlet means extending from and communicating with said gas accumulating chamber,

f. means in the lower portion of said shell operable to agitate the material and feed it upwardly in said shell in a manner to loosen the same as it ascends in the widening area of the upper portion of said shell,

g. suction means downstream from the upper portion of said shell and operable adjustably to induce the inlet of ambient air into said combustion zone through said controlled air inlet ports to control the rate of sintering of the material to generate combustible gas,

h. movable means mounted within the upper portion of said shell below said closure and operable to agitate the solid products resulting from combustion and the sintered products and effect progressive removal thereof laterally from the shell adjacent said combustion zone with the useful gas produced by the sintering of said material, and

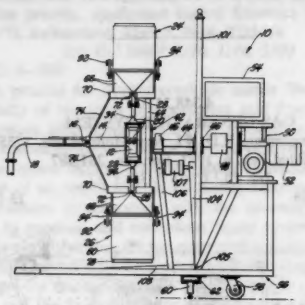
i. means communicating with said gas outlet means to receive said gas and separate the same from the solid products of combustion and the sintered products removed therewith from said combustion zone.

4,348,212

METHOD AND APPARATUS FOR CYCLIC DEGASSING PARTICULATE MATERIAL

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed May 28, 1981, Ser. No. 267,729
Int. Cl.³ B03C 9/00
U.S. Cl. 55—2 9 Claims



1. An apparatus (10, 110) for cleaning particulate material which is at least in part contaminated by gas, said apparatus comprising; a vacuum chamber (12, 112) having a gas outlet (14, 114), vacuum pump means (119) connected to said gas outlet for evacuating said chamber, said vacuum chamber (12, 112) having first (20, 120) and second (22, 122) ends with a flow passage at each end for directing the flow of the particulate material into and out of said chamber electric field producing means (128, 132) positioned and arranged so as to produce an electric field to electrically charge the gaseous contaminates and cause separation of the gaseous contaminates from the particulate material to facilitate removal of the gaseous contaminates from said vacuum chamber (12, 112) through said gas outlet (14, 114), first (24, 124) and second (26, 126) container means connected to and in communication with said flow passages at said first and second ends of said vacuum chamber, support means (42, 142) supporting said vacuum chamber and said first and second container means for initially positioning said first container means (24, 124) above said second container means (26, 126) to allow particulate material to flow from said first container means (24, 124) through said vacuum chamber (12, 112) and into said second container means (26, 126) and for thereafter rotating said vacuum chamber (12, 112) and said first and second container means (24, 124, 26, 126) while connected together to reposition said second container means (26, 126) above said first container means (24, 124) to allow particulate material to return from said second container means (26, 126) in the opposite direction back through said vacuum chamber (12, 112) to said first container means (24, 124).

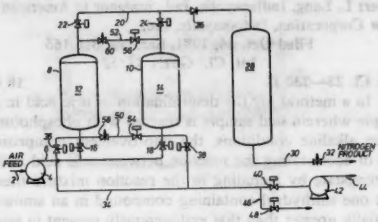
8. A method of cleaning particulate material which is at least in part contaminated by gas, including passing said gas-contaminated particulate material from a first container (24, 124) downward through a vacuum chamber (12, 112) and into a second container (26, 126), subjecting the gas-contaminated particulate material to an electric field to electrically charge the gaseous contaminants to cause the gaseous contaminants to separate from the particulate material, applying a vacuum to the vacuum chamber for removing (14, 114) the gaseous contaminants from the vacuum chamber (12, 112), rotating the first (24, 124) and second (26, 126) containers and the vacuum chamber (12, 112) end-for-end to position the second container (26, 126) above the vacuum chamber (12, 112) and above the first container (24, 124) for passing said gas-contaminated particulate material back through the vacuum chamber (12, 112) and into the first container (24, 124).

4,348,213

PROCESS FOR THE SEPARATION OF A GASEOUS MIXTURE

John W. Armond, Buckhurst Hill, England, assignor to BOC Limited, London, England

Filed Mar. 27, 1981, Ser. No. 248,600
Claims priority, application United Kingdom, Mar. 31, 1980, 8010799
Int. Cl.³ B01D 53/04
U.S. Cl. 55—25 6 Claims



1. A process for the separation of a gas mixture which includes:

(1) repeatedly performing a cycle of operations on a first bed of adsorbent which adsorbs one component of the gas mixture more readily than another or the other component of the gas mixture, the cycle of operations comprising the steps of:

(a) passing the gaseous mixture at superatmospheric pressure through the bed of adsorbent and thereby adsorbing said one component;

(b) reducing the pressure of the bed to a value intermediate said superatmospheric pressure and atmospheric pressure;

(c) regenerating the bed, which step comprises desorbing gas therefrom by further reducing the pressure of the bed, and causing the desorbed gas to flow out of the bed in a direction counter to the direction of passing the gaseous mixture, and

(d) increasing the pressure of the bed to a value intermediate said superatmospheric pressure and atmospheric pressure;

(2) repeatedly performing such a cycle of operations on a second bed of such adsorbent; wherein the cycles are phased such that when the pressure of one bed is reduced after desorption but before its regeneration, the pressure of the other bed is being increased after its regeneration but before adsorption, and vice versa, and the steps (b) and (d) are performed by placing the beds in communication with one another through at least one restricted passage for a period of time insufficient for the pressures of the beds to equalise.

4,348,214

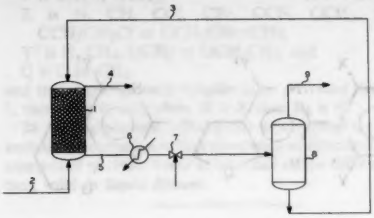
HYDROGEN SULFIDE REMOVAL WITH SULFUR-CONTAINING ESTERS

Bruce W. Gordon, Borger, Tex., and Edward E. Huxley, Fritch, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 31, 1981, Ser. No. 249,547
Int. Cl.³ B01D 19/00
U.S. Cl. 55—48 5 Claims

1. Process to remove hydrogen sulfide from a feed gas stream comprising contacting this feed gas stream with a solvent comprising at least one ester containing 1–4 ester groups COOR wherein R is a hydrocarbyl radical having 1–20 C atoms and containing one or more sulfur groups selected from

the group consisting of —SH and —$(S)_x$—, x being an integer of 1 to 6, to produce a solution of hydrogen sulfide in said



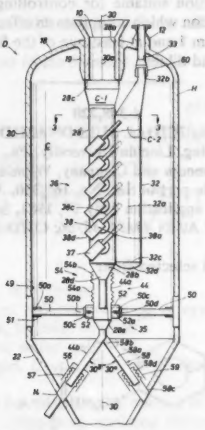
solvent and a gas stream having reduced hydrogen sulfide content as compared to the feed gas stream.

4,348,215

PARTICULATE SEPARATION DEVICE

Manfred F. Dehne, 14350 Chrisman Rd., Houston, Tex. 77039

Filed Jan. 9, 1981, Ser. No. 223,801
Int. Cl.³ B01D *45/12*; B04C *5/04, 5/185*
U.S. Cl. 55—349 **12 Claims**



1. In a particulate separating device, including a main vessel housing forming a particulate chamber, a particulate-laden housing mounted within said main vessel housing and forming a particulate-laden gas chamber said main vessel having a first particulate outlet, a clean gas housing mounted within said main vessel housing adjacent said particulate-laden gas housing and forming a clean gas chamber, a particulate-laden gas inlet in fluid communication with said particulate-laden gas chamber, a clean gas outlet in fluid communication with said clean gas chamber, a plurality of cyclone separator units each mounted to said particulate-laden gas chamber and said clean gas chamber, and said main vessel having a second particulate outlet in fluid communication with said particulate chamber, the improvement comprising:

particulate transfer means being connected to both said particulate-laden gas chamber and said first particulate outlet;

said particulate transfer means including a particulate transfer body having a substantially vertical axis;

said first particulate outlet being horizontally displaced from said particulate transfer body axis;

said particulate transfer means further including an angled conduit portion mounted between said particulate transfer body and said first particulate outlet; and

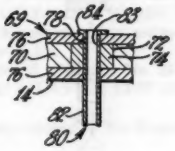
angled compensation means mounted between said particulate transfer body and a location on said main vessel housing diametrically opposite said first particulate outlet for reducing thermal expansion forces exerted on said particulate transfer body by said angled conduit portion.

4,348,216

METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Mohinder S. Bhatti, and Alfred Marzocchi, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 27, 1980, Ser. No. 200,650
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—1 **24 Claims**



23. A laminated wall for a feeder for supplying streams of molten glass to be attenuated into filaments comprising:

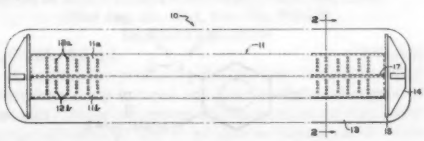
a refractory metal core having an oxygen impervious, precious metal, first layer having a first surface intimately bonded thereto by hot isostatic pressing to form a laminate, and an element positioned in said core having at least one orifice extending therethrough adapted to permit said molten glass to pass therethrough, said element having an end surface sealed to said first surface of said first layer.

4,348,217

METHOD OF CONTROLLING FILAMENT FORMATION IN A GLASS FIBER BUSHING

Kenneth T. Williamson, Jr., Glenshaw; Samuel S. Bruce, Jr., Pittsburgh, both of Pa., and Walter L. Martin, Jr., Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 111,753, Jan. 14, 1980, abandoned. This application Jan. 26, 1981, Ser. No. 228,445
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—2 **6 Claims**



1. A method of controlling the formation of filaments from a molten glass source in a fiber forming bushing comprising establishing in the bushing at least two groups of orifices, the orifices in each of the groups having different diameters, pulling glass fibers from each group of orifices simultaneously and chopping the fibers into discrete lengths as they are being pulled, and controlling the formation and pulling of the glass fibers to minimize interruption by maintaining the difference in orifice size in any two groups between 0.0215 to 0.015 inch.

4,348,218

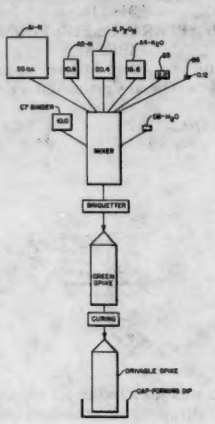
FERTILIZER BRIQUETTE ADAPTED TO BE HAMMERED INTO THE GROUND

Allen M. Bond, Jr., Louisville, Ky., assignor to International Spike, Inc., Lexington, Ky.

Continuation of Ser. No. 827,545, Aug. 25, 1977, abandoned, which is a continuation of Ser. No. 419,899, Nov. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 235,257, Mar. 16, 1972, abandoned. This application May 24, 1978, Ser. No. 909,033

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—1 **15 Claims**



1. A hard, rigid fertilizer product compacted by briquetting and having a shape, mechanical strength and an impact resistance which adapts it to be hammered while unsupported into the ground without significant shattering and having a substantially homogeneous composition consisting essentially of from 85% to 95% by weight substantially nonfibrous NPK fertilizer source materials bonded together by from 15% to 5% by weight of a substantially water insoluble cured thermosetting resinous binder based on the dry weight of the mixture.

4,348,219

HERBICIDAL SULFONAMIDES

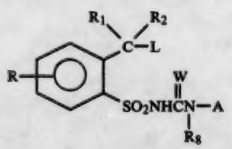
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 168,348, Jul. 11, 1980, abandoned. This application Apr. 29, 1981, Ser. No. 254,256

Int. Cl.³ A01N *43/54, 43/66;* C07D *239/42*

U.S. Cl. 71—92 **28 Claims**

1. A compound of the formula:



wherein

L is CO_2R_{10}, $CONR_3R_4$ or CN;

R is H, F, Cl, Br, NO_2, CF_3, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_1 is H or C_1–C_4 alkyl;

R_2 is H or CH_3;

R_3 is H, C_1–C_4 alkyl or OCH_3;

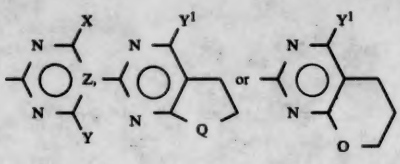
R_4 is H or C_1–C_4 alkyl;

R_3 and R_4 can be taken together to form $—(CH_2)_4—$, $—(CH_2)_5—$ or $—(CH_2CH_2)_2O$;

R_8 is H, CH_3 or OCH_3;

R_{10} is H, C_1–C_4 alkyl, C_3–C_4 alkenyl, CH_2CH_2Cl or $CH_2CH_2OCH_3$;

A is



W is O or S;

X is H, Cl, Br, CH_3, CH_2CH_3, C_1–C_3 alkoxy, CF_3, SCH_3 or CH_2OCH_3;

Y is CH_3 or OCH_3;

Z is N, CH, CCl, CBr, CCN, CCH_3, CCH_2CH_3, CCH_2CH_2Cl or $CCH_2CH{=}CH_2$;

Y^1 is H, CH_3, OCH_3 or OCH_2CH_3; and

Q is O or CH_2;

and their agriculturally suitable salts; provided that:

(1) when L is $CONR_3R_4$, then Z is CH or N;

(2) when R_3 is OCH_3, then R_4 is CH_3; and

(3) when W is S, R_8 is H.

13. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,348,220

HERBICIDAL SULFONAMIDES

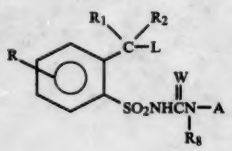
Gregory W. Schwing, Lincoln University, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 168,350, Jul. 11, 1980, abandoned. This application May 27, 1981, Ser. No. 264,661

Int. Cl.³ A01N *43/54, 43/66;* C07D *230/42*

U.S. Cl. 71—92 **43 Claims**

1. A compound selected from



(I)

wherein

L is $S(O)_nR_7$ or OR_9;

R is H, F, Cl, Br, NO_2, CF_3, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_1 is H or C_1–C_4 alkyl;

R_2 is H or CH_3;

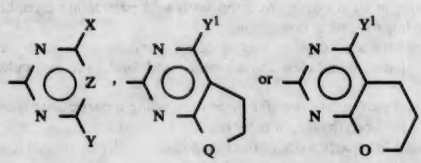
R_7 is C_1–C_4 alkyl;

R_8 is H, CH_3 or OCH_3;

R_9 is C_1–C_6 alkyl, C_3–C_4 alkenyl, CH_2CF_3, CF_2CF_2H or C_5–C_6 cycloalkyl;

n is 0, 1 or 2;

A is



W is O or S;

X is H, Cl, Br, CH_3, CH_2CH_3, C_1–C_3 alkoxy, CF_3, SCH_3 or CH_2OCH_3;
Y is CH_3 or OCH_3;
Z is N, CH, CCl, CBr, CCN, CCH_3, CCH_2CH_3, CCH_2CH_2Cl or $CCH_2CH{=}CH_2$;
Y^1 is H, CH_3, OCH_3 or OCH_2CH_3; and
Q is O or CH_2;
and their agriculturally suitable salts; provided that when n is 1, then W is 0; and when W is S, then R_8 is H.

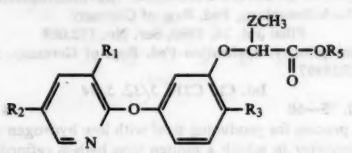
28. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,348,221
HERBICIDAL DERIVATIVES OF PYRID-2-YLOXYPHENOXY-ACETIC ACIDS AND ESTERS

Henry Szczepanski, Rheinfelden; Otto Rohr, Therwil, both of Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Beat Böhner, and Hermann Rempfler, both of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 19,999, Mar. 12, 1979, Pat. No. 4,233,054. This application Jun. 16, 1980, Ser. No. 159,534
Claims priority, application Switzerland, Mar. 17, 1978, 2932/78
Int. Cl.³ C07D *213/57, 213/64;* A01N *43/40*
U.S. Cl. 71—94 6 Claims

1. A compound of the formula



in which
R_1 is chlorine or bromine,
R_2 is hydrogen, chlorine, bromine or cyano,
R_3 is chlorine, bromine or nitro
Z is oxygen or sulfur, and
R_5 is hydrogen, C_1–C_3 alkyl, allyl, cyclohexyl, phenyl or benzyl.

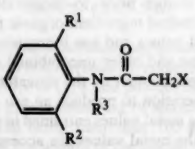
6. A method for the selective control of weeds in crops of cereals or rice comprising applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim 1.

4,348,222
HERBICIDAL N-HALOACETYL-2-ALKYL-6-ACYLANILINES

John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 53,877, Jul. 2, 1979, Pat. No. 4,244,730. This application Jul. 28, 1980, Ser. No. 172,788
Int. Cl.³ A01N *37/22, 37/24*
U.S. Cl. 71—118 5 Claims

1. A compound of the formula:



wherein R^1 is alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; R^2 is acyl of 2 to 4 carbon atoms or a group having the formula:

wherein R^4 is alkyl of 1 to 3 carbon atoms and R^6 is hydrogen or alkyl of 1 to 3 carbon atoms; R^3 is hydrogen or alkyl of 1 to 4 carbon atoms; and X is halogen.

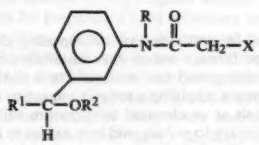
4. An herbicidal composition comprising a biologically inert carrier and an herbicidally effective amount of the compound of the formula defined in claim 1.

4,348,223
N-ALKYL-N-[3-(ALKOXYALKYL)PHENYL]-2-HALOACETAMIDE HERBICIDES

William S. Grove, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 5, 1980, Ser. No. 216,574
Int. Cl.³ A01N *37/22;* C07C *103/32*
U.S. Cl. 71—118 5 Claims

1. A compound represented by the formula:



wherein:
R is alkyl containing up to 5 carbon atoms;
R^1 is hydrogen or alkyl containing up to 4 carbon atoms;
R^2 is alkyl containing up to 3 carbon atoms; and
X is halogen.

4,348,224
METHOD FOR PRODUCING COBALT METAL POWDER

Richard G. W. Gingerich; Clarence D. Vanderpool; Richard A. Scheithauer, and Joseph E. Ritsko, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,868
Int. Cl.³ C22B *23/04*
U.S. Cl. 75—0.5 AA 7 Claims

1. A process for producing fine particle size cobalt metal powder from scrap material comprising cobalt and copper or silver, said process comprising digesting said scrap material in aqueous hydrochloric acid to produce an aqueous acid cobalt chloride solution containing copper ions or silver ions, contacting said aqueous acid cobalt chloride solution at a pH of from about 2 to about 4 with a sufficient amount of iron metal to result in the cementation of said copper ions or silver ions with said iron to form an insoluble mixture comprising iron and copper or silver and a resulting aqueous acid cobalt chloride solution, complexing cobalt present in said aqueous cobalt chloride solution with ammonia to form a cobalt ammine chloride solution, forming a cobalt containing precipitate, and reducing said cobalt containing precipitate to form a cobalt metal powder.

4,348,225

BATCH PROCESS AND STATIC-BED TYPE APPARATUS FOR REDUCING IRON ORE

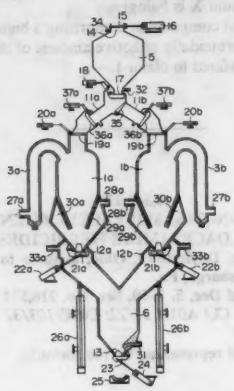
Takuya Maeda; Tsutomu Yamada, both of Kobe, and Mitsuharu Kishimoto, Miki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 25, 1980, Ser. No. 124,229

Claims priority, application Japan, Feb. 26, 1979, 54-22225

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—34 **9 Claims**



1. A method for producing iron comprising charging into a static bed type furnace means raw materials containing iron oxides, maintaining said raw materials in a static bed within said furnace means, applying a reducing agent to said static bed of raw materials at an elevated temperature sufficient to and for a time necessary to reduce said iron oxides to iron, transferring said reduced materials prior to substantial cooling thereof to a cooling chamber means maintained separate from said furnace means and cooling said iron-containing materials wherein said reducing agent is gaseous, the raw materials charging step is immediately preceded by a step of filling the furnace means with inert gas and the transferal of reduced materials to the cooling chamber is immediately preceded by a step of filling the cooling chamber means with inert gas.

4,348,226

DIRECT REDUCTION PROCESS FOR PRODUCING METALLIC IRON

Mamoru Aoki; Masahiro Tomita; Kei Utsunomiya, all of Kobe; Hironobu Sako, Yokohama; Dentaro Kaneko, Kobe; Katsunori Shimazaki, Kobe, and Yoshitomo Ishii, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Sep. 11, 1980, Ser. No. 186,131

Claims priority, application Japan, Sep. 11, 1979, 55-116801

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—35 **12 Claims**

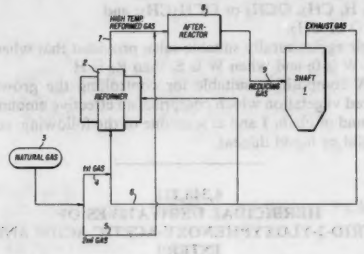
1. In a process for the direct reduction of iron oxide by blowing into a reduction furnace a reducing gas which is prepared by reforming a mixture of a reduction furnace exhaust gas and a gas mainly composed of methane, the improvement which comprises the steps of:

(a) dividing the gas mainly composed of methane into two branch streams;

(b) mixing the first branch stream gas with a part of the reduction furnace exhaust gas and supplying the resulting mixture to the externally heated reformer furnace, to produce a high-temperature reformed gas;

(c) mixing the second branch stream gas with said high-temperature reformed gas, thereby forming a gas mixture having a $CH_4/(CO_2+H_2O)$ volume ratio of 0.5–0.7, and, during the course to the reduction furnace, subjecting the mixture to endothermic reforming reactions in an after-reactor without external heating, utilizing the sensible heat of the high-temperature mixed gas;

(d) controlling the self-reforming reactions so as to lower the



temperature and simultaneously adjust the composition of the high-temperature mixed gas; and

(e) blowing the reducing gas obtained into the reduction furnace.

4,348,227

PROCESS FOR PRODUCING STEEL WITH LOW HYDROGEN CONTENT IN A THROUGH-BLOWING OXYGEN CONVERTER

Karl Brotzmann, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 172,008

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931957

Int. Cl.³ C21C *5/32, 5/34*

U.S. Cl. 75—60 **4 Claims**

1. A process for producing steel with low hydrogen content in a convertor in which a molten iron bath is refined (1) by means of oxygen introduced into the bath by means of nozzles located below the bath surface, said oxygen being introduced together with a sheathing of a protective medium and (2) means of oxygen introduced into the bath by oxygen blowing devices located above the bath surface, which comprises the following improved procedure to insure production of a steel having a hydrogen content of about 2 ppm or less:

introducing at least half of the quantity of oxygen required for refining by blowing the same onto the bath and operating the nozzles located below the surface of the bath with hydrogen free gases as the protective medium during the final 0.1 to 2 minutes of the refining procedure.

4,348,228

YIELD OF METAL VALUES FROM INCINERATED SLUDGES

George L. Zarur, Springfield, Va., assignor to World Resources Company, McLean, Va.

Filed Sep. 9, 1980, Ser. No. 185,465

Int. Cl.³ C22B *15/00*

U.S. Cl. 75—97 R **5 Claims**

1. A process for improving the yield of metal values recovered from dewatered organic sludge by the addition of selected additives to the sludge prior to incineration, wherein the sludge has as a principal ingredient organic matter complexed with certain metal values and has inorganic matter including silica, alumina, lime and other uncombined metal values, and wherein the organic content of the dewatered sludge is then degraded by incineration to produce an ash comprising residual solids including metal values entrained in soluble refractory materials so that the metal values are accessible for recovery by hydrometallurgical extraction, the process comprising:

(a) mixing additives with the dewatered sludge to form a

mixture of the sludge with said additives prior to incineration, said additives being alkali metal salts selected from the soluble salts of sodium and potassium including chlorides, carbonates, bicarbonates, oxides, hydroxides, nitrates and sulfates, and the additives being added in sufficient quantity to provide an excess of alkali metal atoms beyond the proportion thereof required to convert the silica to acid leachable silicates:

(b) incinerating said mixture of dewatered sludge and additives to drive off the organic matter and produce an ash including said silicates in soluble forms;

(c) acid leaching the ash to produce liquid and solid components respectively containing different metal values; and

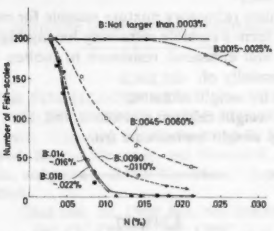
(d) recovering selected metal values from said components.

4,348,229

ENAMELLING STEEL SHEET

Kenichiro Suemmune and Masami Osawa, both of Kitakyusyu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 180,486
Int. Cl.³ C22C *38/06*
U.S. Cl. 75—124 **8 Claims**



1. An enamelling steel sheet consisting essentially of not larger than 0.10% carbon, 0.023 to 0.10% aluminum, 0.004 to 0.020% boron, 0.0089 to 0.020% nitrogen, the balance being iron and unavoidable impurities wherein combined boron and nitrogen effectively resist fish-scales.

3. An enamelling steel sheet consisting essentially of not larger than 0.10% carbon, 0.023 to 0.10% aluminum, 0.004 to 0.020% boron, 0.0089 to 0.020% nitrogen, and one or more of 0.1 to 2.0% silicon, 0.50 to 2.0% manganese, 0.1 to 2.0% chromium and 0.05 to 0.15% phosphorus, the balance being iron and unavoidable impurities wherein combined boron and nitrogen effectively resist fish-scales.

7. An enamelling steel sheet consisting essentially of 0.003 to 0.052% carbon, 0.023 to 0.062% aluminum, 0.008 to 0.0171% boron, 0.0089 to 0.0160% nitrogen, 0.03 to 0.51% silicon, 0.16 to 1.30% manganese, 0.01 to 0.36% chromium, 0.020 to 0.10% phosphorus, the balance being iron and unavoidable impurities.

4,348,230

BRIQUETTES OF SILICON AND FERROSILICON DUST

Pierre C. Aitcin; Philippe Pinsonneault, and Roland Fortin, all of Sherbrooke, Canada, assignors to Universite de Sherbrooke, Sherbrooke, Canada

Filed Feb. 3, 1981, Ser. No. 231,476
Int. Cl.³ C21C *7/00*
U.S. Cl. 75—129 **8 Claims**

1. A compacted unit of metallurgical grade granular material selected from silicon and ferrosilicon comprising a compressed homogeneous mixture of (1) a fine powder of a silicon material selected from the group consisting of silicon and ferrosilicon, said silicon material being finer than 160 μm, (2) from 2 to about 5% based on the weight of the silicon material of sodium or calcium bentonite and (3) from 2 to about 5% based on the weight of the silicon material of sodium or calcium lignosulfonate.

4,348,231

METHOD OF RECOVERING METAL CARBIDES

Joseph E. Ritsko; Martin B. MacInnis, and Thomas L. Henson, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 17, 1980, Ser. No. 141,017
Int. Cl.³ C22C *29/00*
U.S. Cl. 75—203 **8 Claims**

1. A process for recovering selected portions of metal carbide from scrap material containing pieces of cemented metal carbide, said pieces having various compositions of metal carbide distributed in a matrix material, said process comprising treating the scrap material with a suitable liquid for a sufficient period of time to dissolve the matrix material into the liquid to form pieces of matrix depleted metal carbide, separating the liquids containing dissolved matrix material from the pieces of matrix depleted metal carbide, feeding the pieces of matrix depleted metal carbide into a ferrofluid material, passing a magnetic field through said fluid for positioning the pieces of matrix depleted metal carbide of the type having a heavier density spaced from the pieces of matrix depleted metal carbide of the type having a lighter density, collecting portions of pieces of matrix depleted metal carbide having a heavier density separate from the portion of pieces of matrix depleted metal carbide having a lighter density.

5. A process for preparing a hard refractory cemented metal carbide body from a scrap material containing pieces of cemented metal carbide, said pieces having various compositions of metal carbide distributed in a matrix material, said process comprising treating the scrap material with a suitable liquid for a sufficient period of time to dissolve the matrix material into the liquid to form pieces of matrix depleted metal carbide, separating the liquid containing dissolved matrix material from the pieces of matrix depleted metal carbide, feeding the pieces of matrix depleted metal carbide into a ferrofluid material, passing a magnetic field through said fluid for positioning the pieces of matrix depleted metal carbide particles of the type having a heavier density spaced from the pieces of matrix depleted metal carbide of the type having a lighter density, collecting portions of pieces of matrix depleted metal carbide having a heavier density separate from a portion of pieces of matrix depleted metal carbide having a lighter density, comminuting at least one of said portions of metal carbide to form a metal carbide powder, mixing said metal carbide powder with a binder metal to form a resulting powder, and compressing and sintering said resulting powder to form a hard cemented metal carbide body.

4,348,232

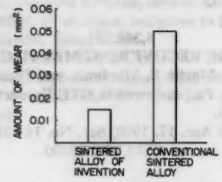
ABRASION RESISTANT FERRO-BASED SINTERED ALLOY

Takeshi Hiraoka, Ageo; Shigeru Urano, Omiya; Masajiro Takeshita, Yono, and Keiji Nakamura, Funabashi, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,452
Claims priority, application Japan, May 7, 1979, 54-54746
Int. Cl.³ B22F *3/12*
U.S. Cl. 75—238 **2 Claims**

1. An abrasion resistant ferro-based sintered alloy comprising 0.8 to 1.5% by weight of carbon, 0.5 to 2.5% by weight of chromium, 2.0 to 6.0% by weight of molybdenum, 1.5 to 5.0% by weight of nickel, 0.1 to 2.0% by weight of tungsten, 0.2 to 5.0% by weight of copper and the balance iron wherein said alloy contains molybdenum particles around which nickel is

distributed and which are uniformly dispersed in the base structure comprising a mixture of pearlite, bainite and martens-



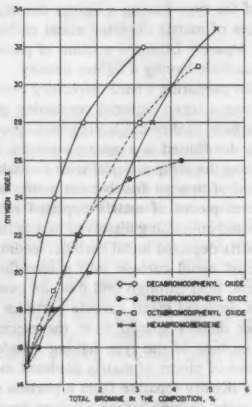
ite and said alloy contains composite carbide of Fe-Cr-W-C dispersed in the base structure.

4,348,233

PLASTICIZED SULFUR COMPOSITION

Milutin Simic, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 17, 1981, Ser. No. 255,084
Int. Cl.³ C09D *5/18*; C09K *3/28*
U.S. Cl. 106—18.23 **9 Claims**



1. A plasticized sulfur composition comprising at least 50% by weight sulfur, from about 0.05% to about 25% by weight sulfur plasticizer, from about 1.0% to about 40% by weight inorganic filler, and from about 0.1% to about 10% by weight decabromodiphenyl oxide.

4,348,234

COATING COMPOSITIONS FOR THE PRODUCTION OF A RECORDING MATERIAL

Manuel Cespon, Vienna, Austria, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,304
Claims priority, application Austria, Mar. 20, 1979, 2073/79
Int. Cl.³ C09D *11/00*
U.S. Cl. 106—21 **12 Claims**

1. A coating composition for the production of a pressure-sensitive recording material based on a color former composition and a color developer composition, said color developer composition containing, a color developer consisting essentially of a mixture of at least two water-soluble inorganic metal salts, including at least one nitrate with a molecular weight of 150 to 350 and at least one halide with a molecular weight of 120 to 280.

4,348,235

STOP-LEAK COMPOSITION FOR AUTOMOBILE COOLING SYSTEMS AND THE LIKE

Tull C. Lasswell, and John L. Monier, both of Oxford, Mich., assignors to Tri-X Corporation, Oxford, Mich.

Filed Jun. 27, 1980, Ser. No. 163,818
Int. Cl.³ C09K *3/12*
U.S. Cl. 106—33 **6 Claims**

1. A stop-leak composition for the cooling system of an internal combustion engine and the like consisting essentially of ginger rhizome flour, ground nut shells, boric acid powder, sodium lignin sulfonate powder and magnesium stearate.

4,348,236

COMPOSITION FOR CASTABLE REFRACTORY BLOCK

James E. Hines, Jr., Monroeville, Pa., and Richard G. LaBar, deceased, late of Murrysville, Pa. (by Judith LePage LaBar, executor), assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 9, 1980, Ser. No. 185,480
Int. Cl.³ B28B *7/36*
U.S. Cl. 106—38.27 **24 Claims**

1. A particulate refractory mixture suitable for combination with water to form a castable refractory having high strength, low porosity and enhanced resistance to molten aluminum, consisting essentially of:

79.5–89.5% by weight alumina;

10–20% by weight calcium aluminate; and

0.5–1.5% by weight borosilicate frit.

4,348,237

ADDITIVE COMPOSITION AND METHOD OF USING SAME

P. Jay Ruckel, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Jun. 20, 1980, Ser. No. 161,714
Int. Cl.³ C08L *91/00, 95/00*
U.S. Cl. 106—122 **3 Claims**

1. In a method of generating foamed asphalt wherein heated liquid asphalt is contacted with liquid water and subsequently expanded through a nozzle to generate a foamed asphalt, the improvement wherein an effective amount of a liquid additive comprising at least 20 percent by weight metal stearate dispersed in a hydrocarbon carrier oil having a poor point of not more than 0° C., an initial boiling point of at least 200° C. and a flash point of at least 150° C. is added to said asphalt prior to generation of said foam, said metal stearate being present in an amount less than the amount which would render the additive non-liquid at ambient temperatures.

4,348,238

MANUFACTURE OF CELLULOSE ESTER FILM

Harry J. Krall, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 26, 1980, Ser. No. 163,249
Int. Cl.³ C08B *1/00*
U.S. Cl. 106—177 **15 Claims**

1. In a method for the manufacture of a cellulose ester film in which a film-forming composition comprising a cellulose ester disolved in a solvent is cast upon a smooth surface, said solvent is partially evaporated, and said composition is stripped from said surface in the form of a film, the improvement comprising incorporating in said composition a polyethoxylated phosphate ester in an amount sufficient to promote stripping of said film.

4,348,239

PROCESS FOR COLORING ORGANIC MATERIAL OF HIGH MOLECULAR WEIGHT

Arnold Wick, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

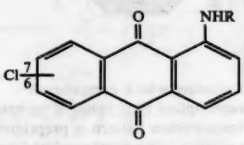
Continuation of Ser. No. 968,318, Dec. 11, 1978, abandoned. This application Jul. 31, 1980, Ser. No. 174,309

Claims priority, application Switzerland, Dec. 29, 1977, 15572/77

Int. Cl.³ C08K *3/04*

U.S. Cl. 106—193 D 2 Claims

1. A process for the mass coloration of organic materials of high molecular weight which comprises incorporating into said material a mixture of anthraquinone compounds of the formula:



(1)

wherein R represents unsubstituted 1-anthraquinone.

4,348,240

PROCESS FOR DEACTIVATING SOLUBLE METAL CATIONS IN IRON OXIDE PIGMENTS

Arvind S. Patil, Wyoming, Mich.; Siegfried P. Kersten, Frankenthal, Fed. Rep. of Germany, and Werner P. Fliege, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 22, 1980, Ser. No. 218,863

Int. Cl.³ C04B *31/02*; C09C *1/24*

U.S. Cl. 106—304 8 Claims

1. A process for deactivating soluble metal cations contained in synthetic iron oxide pigments having a yellow shade which are prepared under acidic conditions comprising

A. adding, while oxidizing, an alkalizing compound to iron oxide pigment slurry until the pH of the pigment slurry is greater than 9; and

B. separating the iron oxide pigment from the liquid phase of the slurry.

7. An iron oxide pigment devoid of active soluble metal cations prepared in accordance with the process of claim 1.

4,348,241

HEAT-TREATMENT OF SEMIFINISHED PRODUCT-SLIDING SURFACE OF SHAPING MEMBERS IN PLASTIC METAL-WORKING APPARATUS

Saburo Kunioka, Kawagoe; Hatsuo Kawaguchi, Ogawa, and Minoru Ono, Hidaka, all of Japan, assignors to Shinhokoku Steel Corporation, Kawagoe, Japan

Filed Feb. 12, 1981, Ser. No. 233,859

Int. Cl.³ C23F *7/04*

U.S. Cl. 148—6.35 12 Claims

1. A method of heat-treating the sliding surface of a shaping ferrous metal member used in a metal-working apparatus which in service is abrasively contacted with a sliding semifinished ferrous metal product to provide a coated sliding surface which has superior abrasion resistance, said method comprising the steps of:

placing the shaping metal member in a furnace using a gaseous fuel;

incompletely burning the fuel to provide an atmosphere composed of 1 to 4% of CO, 8 to 12% of CO_2, 0 to 0.5% of O_2, 16 to 18% of H_2O, and N_2 and other inert gases jointly constituting the remainder by means of controlling the amount of secondary air introduced into the furnace;

heating the shaping metal member in said atmosphere at a temperature of from 900° to 1,200° C. for 3 to 5 hours; and annealing or quenching the heat-treated metal member.

4,348,242

ALUMINUM POWDER BLASTING SLURRY SENSITIZER

John H. O'Dette, and Stanton E. Jack, both of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 27, 1979, Ser. No. 97,885

Claims priority, application United Kingdom, Nov. 29, 1978, 46516/78

Int. Cl.³ C06B *45/34*

U.S. Cl. 149—7 10 Claims

1. A process for preparing a water dispersable aluminum powder composition which comprises comminuting a particulate aluminum feed in a hydrocarbon medium and in the presence of from 0.5% to 1.5% by weight, based on the weight of the aluminum present, of a polyvinylpyrrolidone resin powder, until a desired aluminum particle size is reached, and thereafter removing the majority of the hydrocarbon medium to provide an aluminum paste composition containing 15% to 30% by weight of hydrocarbon medium.

4,348,243

THERMAL INSULATION, A PROCESS FOR PREPARING SAID INSULATION AND A PIPE INSULATED THEREWITH

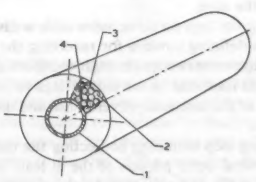
Ingo Craubner, Munich, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 949,587, Oct. 10, 1978, abandoned. This application Feb. 12, 1980, Ser. No. 120,791

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1977, 2747579

Int. Cl.³ E04B *2/00*; E04F *13/00*

U.S. Cl. 156—71 1 Claim



1. A process for preparing a thermally insulated article which consists essentially of completely filling a space between the article to be insulated and a jacket which has been positioned concentrically around the article with a plurality of hollow structures, each in contact with adjacent hollow structures, maintaining the hollow structures in their original position while adding an organopolysiloxane composition capable of being cured to an elastomeric solid to said space to fill the interstices between the adjacent hollow structures, and thereafter curing the organopolysiloxane composition to an elastomer.

4,348,244

LUBRICATING COMPOSITIONS FOR PRIMARY BACKING FABRICS USED IN THE MANUFACTURE OF TUFTED TEXTILE ARTICLES

John D. Shepley, and Herman M. Muijs, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 48,289, Jun. 13, 1979, Pat. No. 4,288,331. This application May 4, 1981, Ser. No. 260,139

Claims priority, application United Kingdom, Oct. 20, 1978, 41466/78

Int. Cl.³ D06M *13/18;* B32B *5/00*

U.S. Cl. 156—72 **4 Claims**

1. In the process for the manufacture of tufted textile articles by inserting yarn into a primary backing fabric by means of needles, the improvement which comprises coating said primary backing fabric with a lubricating composition prior to needle insertion of yarn into the primary backing fabric, where said lubricating composition comprising a major amount of a polyalkoxylate lubricating oil and 0.001 to 10% by weight, based on the polyalkoxylate lubricating oil, of a saturated or unsaturated aliphatic carboxylic acid of from 10 to 20 carbon atoms.

4,348,245

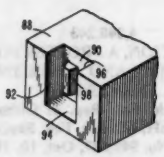
METHOD AND APPARATUS FOR ULTRASONIC BONDING OF COUPLING ELEMENTS TO A TAPE

Norman W. MacFee, R.D. #1, Conneaut Lake, Pa. 16316

Division of Ser. No. 932,891, Aug. 10, 1978, Pat. No. 4,259,272, which is a division of Ser. No. 809,842, Jun. 24, 1977, Pat. No. 4,115,489. This application Mar. 12, 1980, Ser. No. 129,815

Int. Cl.³ B29C *27/08;* B29D *5/00*

U.S. Cl. 156—73.1 **3 Claims**



1. A method of attaching a coupling element to an edge of a tape comprising the steps of

placing a pair of legs of the coupling element on opposite sides of the tape,

surrounding the legs on three sides with walls of respective members defining cavities for receiving the legs, and

applying ultrasonic energy through energizer means projecting into at least one of the pair of legs to fuse the legs to the edge of the tape and prevent flash and distortion of the legs,

said applying step including projecting the energizer means into a central outer portion of the at least one leg spaced from the walls and only to a depth substantially less than the depth of the walls.

3. An ultrasonic horn tip for bonding legs of coupling elements to a tape comprising

a member having a front face with a cavity formed in the upper portion thereof defining three walls surrounding the cavity with the top side of the cavity being open for receiving a leg of a coupling element on an edge of the tape, and said member further having an energizing projection positioned centrally within the cavity spaced from the three walls and projecting into the central portion of the cavity to a depth less than the depth of the three walls to direct energy to the leg of the coupling element.

4,348,246

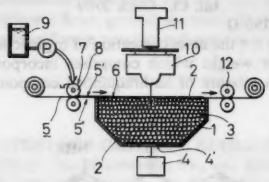
METHOD OF PRINTING

Motoyasu Nakanishi, Shimizu, Japan, assignor to Suzuki Sogyo Kabushiki Kaisha and Kabushiki Kaisha Cubic Engineering, both of Shizuokaken, Japan

Filed Jan. 6, 1981, Ser. No. 222,882

Int. Cl.³ B29C *3/00;* B32B *31/04, 31/20*

U.S. Cl. 156—73.1 **16 Claims**



1. A method of printing which comprises:

positioning a transcription film, made of an extendible film on which a transcription pattern is preprinted to form a transcription surface, on an accumulated granule layer consisting of a plurality of granules, said transcription film being positioned on said accumulated granule layer so that the surface of said transcription film opposite said transcription surface contacts said accumulated granule layer,

contacting a material to be printed against said transcription surface of said transcription film,

impressing said material to be printed in contact with said transcription film into said accumulated granule layer,

vibrating at least one of said accumulated granule layer and said material to be printed while said material to be printed is impressed into said accumulated granule layer, and

transcribing said transcription pattern onto said material to be printed by conducting the internal pressure of said accumulated granule layer to the transcription film.

4,348,247

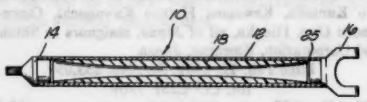
METHOD OF FABRICATING A REINFORCED TUBULAR STRUCTURE

Morris S. Loyd, Northridge, and Timothy W. McGann, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 16,454, Feb. 26, 1979, Pat. No. 4,272,971. This application Feb. 27, 1981, Ser. No. 238,733

Int. Cl.³ B29C *27/16*

U.S. Cl. 156—156 **12 Claims**



1. A method of forming a reinforced tubular structure comprising:

forming a laminate of a plurality of plies of fibrous material in an uncured resin matrix, the laminate having two opposed principal surfaces, the shape of the principal surfaces being substantially trapezoidal;

wrapping the laminate around a flexible mandrel such that the laminate is formed into a variable thickness tube tapering from the middle to the ends thereof;

inserting the flexible mandrel into a metal tube, the metal tube having inner and outer peripheral surfaces; and

co-curing the laminate to the inner peripheral surface of the metal tube such that the laminate is bonded to the inner peripheral surface of the metal tube across a plurality of

windings of the laminate, said flexible mandrel being expanded during said co-curing such that the laminate is compressed between the flexible mandrel and the inner peripheral surface of the metal tube.

4,348,248

PREPARATION OF DE-GASSED COMPLEX PRODUCTS FORMED OF FIBRES IMPREGNATED WITH A PLASTIC MATERIAL

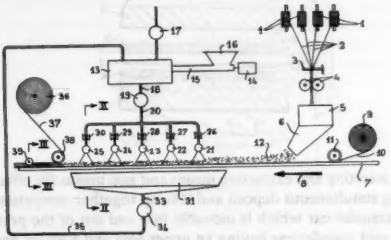
Pierre Poncet, 12bis Rue Trarieux, 69003 Lyons, France

Filed Sep. 29, 1980, Ser. No. 192,162

Claims priority, application France, Oct. 2, 1979, 79 25022

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—276 **3 Claims**



1. In a method for preparation of a de-gassed complex product formed of fibers impregnated with a plastic material, made by creating an endless flat web and conveying it substantially horizontally while passing said web continuously below successive nozzle locations and pouring onto said web said plastic material in liquid state, and collecting and recycling the excess of said plastic material to said nozzle locations, the improvement which comprises:

dividing said nozzle locations into first and second nozzle groups, with said first group being disposed upstream of said second group relative to the movement of said web;

feeding the first group with an auxiliary liquid which is selected to absorb gases from the web and which has been previously fully de-gassed under vacuum, the web being penetrated and progressively washed by the auxiliary liquid to remove gases therefrom, and such auxiliary liquid as is retained by the web being compatible with and dissolved by the plastic material with which said web is to be impregnated;

collecting the excess of said auxiliary liquid which overflows laterally from said web;

fully de-gassing under vacuum said excess of said auxiliary liquid and then recycling it to the first nozzle group;

feeding the second nozzle group with a different liquid material with which said web is to be impregnated and which comprises a plastic material which has previously been fully de-gassed under vacuum;

collecting separately the excess of said plastic material which flows laterally from said web;

and fully de-gassing said collected excess of plastic material and then recycling it to the second nozzle group.

4,348,249

WELL SIDES IN LETTER FEEDING AND LETTER SEALING MACHINES

Horst Denzin, Berlin, Fed. Rep. of Germany, assignor to Francotyp GmbH, Berlin, Fed. Rep. of Germany

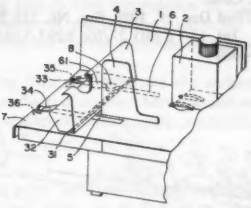
Filed Nov. 19, 1980, Ser. No. 208,492

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 7934228[U]

Int. Cl.³ B29H *9/00*

U.S. Cl. 156—442.2 **2 Claims**

1. Movable, hinged and removable well sides for letter feeding and letter sealing machines, comprising a table having first guide slots formed therein, an angular well side having a leg with two ends and a second guide slot formed in vicinity of an end of said leg, a stop forming another well side and being guidable at least partially in said second slot at a right angle to said leg, two angled-off webs being integral with an end of said leg opposite said second guide slot, projections being integral with said webs and guidable in said first guide slots, and a



screw element being attached to said leg and having a pin and a washer for guiding and locking said angular well side and said stop on said table, said table having a hole formed therein along one of said first guide slots through which said washer is liftable for folding down said angular well side and said stop and through which said web is liftable for removing said angular well side and said stop.

4,348,250

SINGLE FACER FOR MAKING SINGLE FACED CORRUGATED MATERIAL

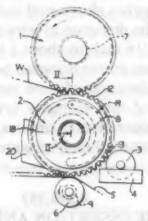
Harold Bromley, Bristol, England, assignor to Masson Scott Thrissell Engineering, Bristol, England

Filed Feb. 13, 1981, Ser. No. 234,151

Claims priority, application United Kingdom, Feb. 20, 1980, 8005708; Feb. 20, 1980, 8005723

Int. Cl.³ B29D *7/14*

U.S. Cl. 156—473 **9 Claims**



1. A single facer for making single faced corrugated material such as board, comprising a first corrugating roll having axially-extending corrugations, a second corrugating roll meshing with the first corrugating roll, means for feeding the material to be corrugated into the nip between the two rolls, means for applying adhesive to the tips of the corrugations produced in the material, means for feeding flat liner material on to the adhesive coated tips of the corrugated material, and means for pressing the liner on to the tips, wherein the second corrugating roll has axially-extending passageways, means for applying suction to at least one end of each of the passageways, and apertures extending substantially radially outwards from said passageways to apply suction from the passageways to the inside surface of the material being corrugated to hold the material into corrugations of the second roll, the second corrugating roll comprising an inner core and an outer sleeve means having on its outer surface the axially-extending corrugations and formed as a number of axially-abutted rings, the outer surface of the core being engaged with the inner surface of the

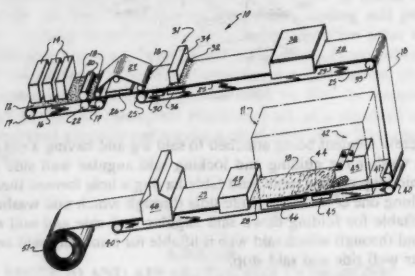
sleeve means, said passageways being provided in one of the engaging surfaces of the core and the sleeve means.

4,348,251

SYSTEM FOR APPLYING BINDING AGENTS TO FIBROUS WEBS

Walter L. Pauls, Appleton, and Raymond A. Dunleavy, III, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 19, 1980, Ser. No. 218,251
Int. Cl.³ B29D 27/00; B29J 5/00
U.S. Cl. 156—500 **5 Claims**



1. An apparatus for applying binding agent as a foam to a fibrous web supported by a moving foraminous carrier wire, comprising:

a foam extruder having means defining a flow passage terminating in an elongate orifice extending transversely of the direction of movement of said wire, said flow passage being inclined between about 2° and about 25° to the plane of said web in a direction opposite to the direction of wire movement,

said elongate orifice including a pair of longer edges positioned at substantially the same distance of from about ¼ and about 3 inches above said web, and spaced one from the other, in the direction of wire movement, a distance of from about 1/16 inch to about ¼ inch,

and a first vacuum means disposed beneath said wire, and, as respects the direction of wire movement, at a point just downstream of said elongate orifice, said first vacuum means being operative to draw a vacuum of from about 0.1 inch to about 1.0 inch of water.

4,348,252

DEVICE FOR THE INSERTION AND EXTRACTION OF A LAMINATING PACK IN AND FROM A PRESS

Heinrich Knoop, Allgau, and Heinrich Pfeiffer, Eppingen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 253,017
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3000967
Int. Cl.³ B30B 15/30, 15/32
U.S. Cl. 156—538 **17 Claims**

1. A device for inserting a workpiece in the form of a laminating pack to be processed into a press in a charging direction and for extracting the workpiece which has become a processed laminate from the press in a discharging direction, the press having a plurality of sides, the device comprising:

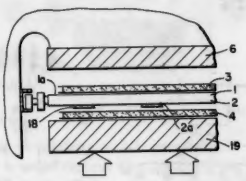
means for charging the press by depositing a laminating pack therein, said charging means including a table for receiving, holding and discharging the laminating pack;

means for discharging the press by taking up a processed laminate from the press, said discharging means including a suction means for gripping the processed laminate by suction; said charging and discharging means being operatively coupled together for cooperation with each other;

a plurality of holding gibs which cooperate with said charging means for holding laminating packs deposited in the press by the charging means;

means for inserting a laminating pack into one side of the press and for extracting a processed laminate from the same side of the press and

means for effecting simultaneous deposit of said laminating pack onto said holding gibs and take up of the processed laminate by said suction means;



said inserting and extracting means and said means for effecting simultaneous deposit and take up together comprising:

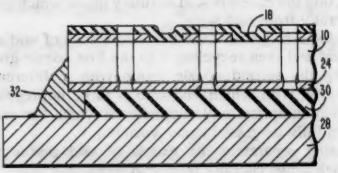
a transfer car which is movable into and out of the press, said transfer car having an upper part and a lower part, said table of said charging means being disposed on said upper part of said transfer car, said suction device of said discharging means being located on said lower part of said transfer car, so that said charging and discharging devices are located one above the other in said transfer car, said charging device, discharging device and transfer car all being part of a single unit which is movable into and out of the press.

4,348,253

METHOD FOR FABRICATING VIA HOLES IN A SEMICONDUCTOR WAFER

Saligrama N. Subbarao, Plainsboro, and Ho-Chung Huang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,430
Int. Cl.³ C23F 1/00
U.S. Cl. 156—643 **7 Claims**



1. A method for fabricating a conductive via hole in a semiconductor wafer, comprising:

forming a layer of apertured photoresist on a first wafer surface;

laser drilling a via hole through said wafer, at a site corresponding to said photoresist aperture;

metallizing a second wafer surface opposing the first surface;

placing the second wafer surface on an adhesive layer on a plating block;

electrically connecting the second surface metallization to the plating block;

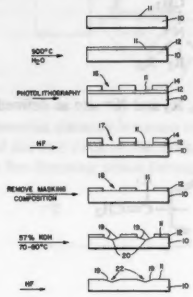
electroplating through the via hole; and

separating the wafer from the plating block and adhesive layer.

4,348,254
METHOD OF MAKING SOLAR CELL

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation of Ser. No. 973,760, Dec. 27, 1978, abandoned, which is a division of Ser. No. 860,892, Dec. 15, 1977, abandoned. This application Jun. 13, 1980, Ser. No. 159,445
Int. Cl.[3] H01L *21/306*
U.S. Cl. 156—647 9 Claims

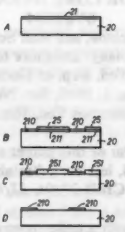


1. A method of making a silicon solar cell having at least one major surface adapted to receive light impinging thereon and absorb and convert such light into electrical energy, comprising providing a silicon wafer having at least one major surface thereof subject to attack by a silicon etchant, masking said surface with a layer resistant to attack by said silicon etchant, said masking layer being formed with open regions therein that expose substantially symmetrical portions of said surface of said silicon wafer, etching said exposed portions of said surface through said open regions of said masking layer with said silicon etchant to produce indentations in said surface, said indentations being in the form of inverted pyramids the apices of which are located inwardly of and the bases of which lie substantially in the plane of said surface, and thereafter forming an electrical junction at said surface, said junction extending along said surface and inwardly thereof into said indentations.

4,348,255
PROCESS FOR THE PREPARATION OF AN OPTICALLY TRANSPARENT AND ELECTRICALLY CONDUCTIVE FILM PATTERN

Walter Schmidt, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jul. 3, 1980, Ser. No. 165,714
Claims priority, application Switzerland, Jul. 4, 1979, 6229/79
Int. Cl.[3] C23F *1/02*; B44C *1/22*
U.S. Cl. 156—656 10 Claims



1. A process for producing a patterned, optically transparent electrically conducting film on a substrate comprising:

(a) providing a substrate coated with a continuous layer of an optically transparent electrically conductive material;

(b) depositing by screen printing on selected areas of said layer an etchant composition comprising an acid etchant for said optically transparent electrically conductive material and a carrier therefor, said etchant being capable of reacting with said optically transparent electrically conductive material to form soluble reaction products;

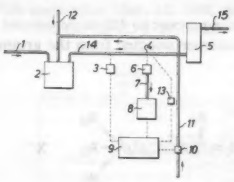
(c) allowing said etchant composition to contact said optically transparent electrically conductive material until said material has reacted with said etchant in said selected areas;

(d) removing from said substrate the etchant composition and the products of reaction between said etchant and said optically transparent electrically conductive material.

4,348,256
PROCESS FOR CONTROLLING THE SUPPLY OF DELIGNIFYING AND/OR BLEACHING CHEMICALS IN THE CONTINUOUS DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL

John R. Bergstrom, Domsjo, and Sten L. Haggstrom, Overnornas, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed May 5, 1978, Ser. No. 903,267
Claims priority, application Sweden, May 11, 1977, 7705513
Int. Cl.[3] D21C *9/10*; G06F *15/46*
U.S. Cl. 162—49 43 Claims



1. A continuous flow process for the delignification of lignocellulosic material, in which there is a throughput of lignocellulosic material through a delignification stage, with addition of delignifying chemicals at at least one location to the delignification, which comprises adding delignifying chemicals to the system in an amount so adjusted according to the ratio for the quantity of delignifying chemicals consumed and the quantity of the delignification chemicals originally charged that the relative consumption of delignifying chemicals is maintained substantially constant.

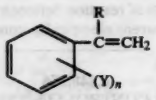
4,348,257
ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Jun. 23, 1980, Ser. No. 161,805
The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.
Int. Cl.[3] D21H *3/82*
U.S. Cl. 162—162 21 Claims

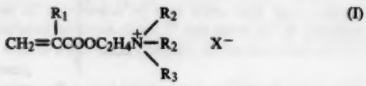
1. In the method of manufacturing paper wherein an opacifying agent is used to provide opacity in the final paper product, either by means of a coating or by means of internal addition to the paper pulp, the improvement wherein there is employed as at least a portion of the opacifying agent water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount

at least sufficient to provide crosslinked graft copolymer particles and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles, said monomer (a) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alphachloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula



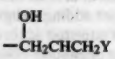
wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate; ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexanediol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate trivinylbenzene; divinylnaphthalene; diallylmaleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of at least one cationic monomer selected from the group consisting of

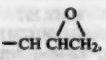


(I)

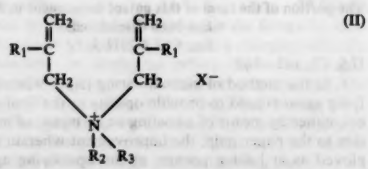
wherein R_1 is hydrogen or methyl, R_2 is hydrogen or a C_1–C_4 alkyl, R_3 is hydrogen, a C_1–C_4 alkyl,



where Y is hydroxyl or halogen,

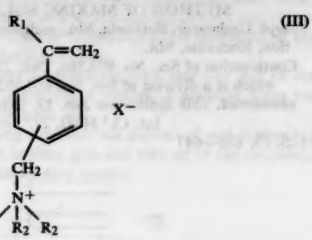


and $-(CH_2CH_2O)_nH$ where n is an integer 1 or more and X^- is an anion,



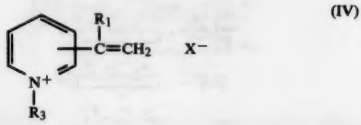
(II)

wherein R_1 is hydrogen or a C_1–C_4 alkyl, R_2 is hydrogen, alkyl or substituted alkyl, and R_3 and X^- are as defined in formula (I),



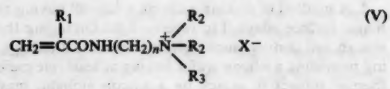
(III)

wherein R_1, R_2, R_3 and X^- are as defined in formula (I),



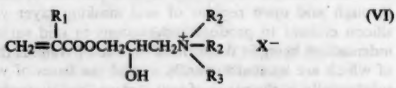
(IV)

wherein R_1, R_3 and X^- are as defined in formula (I),



(V)

wherein R_1, R_2, R_3 and X^- are as defined in formula (I), and n is an integer 1, 2 or 3 and



(VI)

wherein R_1, R_2, R_3 and X^- are as defined in formula (I), and

(ii) from about 95 mole percent to 0 mole percent of at least one ethylenically unsaturated nonionic monomer selected from the group consisting of N-vinyl pyrrolidone, ethylenically unsaturated monomers having amide functionality, and ethylenically unsaturated monomers having hydroxyl functionality,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomer (1) employed.

4,348,258

SPRAY NOZZLE FOR COKE OVEN GAS-COLLECTING SYSTEM

Carl-Heinz Struck, Bochum, and Ralf Schumacher, Hagen, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Aug. 1, 1980, Ser. No. 174,451

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937409

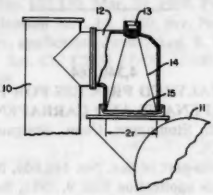
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.³ C10B *27/04, 27/06, 41/08*

U.S. Cl. 202—255 **6 Claims**

1. In combination with a coke oven a multi-orificed nozzle adapted to be fitted into the elbow interconnecting the ascension pipe and main of a coke oven, comprising a generally cup-shaped element having a cylindrical side wall and a bottom wall, nozzle orifices in said bottom wall, said orifices being

frusto-conical in configuration and inclined outwardly with respect to the axis of the nozzle, the orifices being wider at their exit ends than at their entrance ends and being disposed in at least one circle around the axis of the nozzle with the ratio



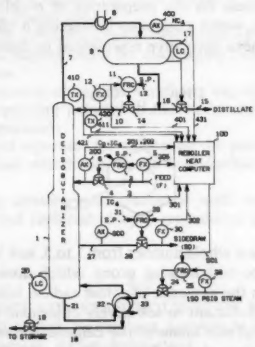
of the circumferential distance between orifices in the circle to the diameter of the exit ends of the orifices being from 1.5 to 2.5, and means for directing steam through the orifices in said nozzle.

4,348,259

CONTROL OF SIDEDRAW ON DISTILLATION COLUMN

Bruce A. Jensen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1980, Ser. No. 195,698
Int. Cl.³ B01D *3/42*
U.S. Cl. 203—1 **19 Claims**



1. In a fractionation distillation process comprising
a. introducing a feed stream into a distillation column,
b. withdrawing a side stream from said distillation column,
c. withdrawing a bottom stream from said distillation column,
d. withdrawing an overhead stream from said distillation column, the improvement comprising
e. controlling the composition of the sidedraw stream or the overhead stream by
aa. automatically establishing a predicting signal representative of the effect of changes in the rate and/or composition of the feed stream on the composition of the stream to be controlled,
bb. automatically determining the deviation of said composition in said stream from a set point,
cc. responsive to the determinations in aa and bb, automatically calculating a control signal,
dd. responsive to said control signal manipulating the heat input to the distillation column.

4,348,260

METHOD FOR INHIBITING POLYMERIZATION OF CONJUGATED DIENES

Hiroshi Hokari, and Iwaki Nishitai, both of Kamakura, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,334
Claims priority, application Japan, Dec. 6, 1979, 54-157384
Int. Cl.³ B01D *3/40*
U.S. Cl. 203—9 **2 Claims**

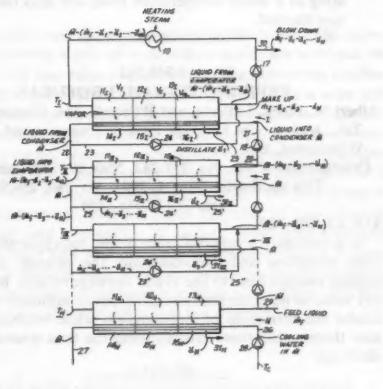
1. In a process for separating a conjugated diene from a hydrocarbon mixture containing the conjugated diene by extractive distillation using dimethyl formamide as an extractive solvent in an amount sufficient to conduct said extractive distillation, a method for inhibiting polymerization of the conjugated diene in the dimethyl formamide at a sufficiently high temperature to otherwise cause polymerization of said conjugated diene, which comprises using furfural and furfural polycondensates as polymerization inhibitors, and controlling the amounts of the polymerization inhibitors such that about 0.01 to about 2% by weight, based on the solvent, of furfural and about 0.5 to about 10% by weight, based on the solvent, of the furfural polycondensates are present in a total amount of about 1 to about 12% by weight, based on the solvent, throughout the entire separating process.

4,348,261

METHOD FOR DISTILLING A LIQUID

Risto Saari, Harjula, 02440 Luoma, Finland

Continuation-in-part of Ser. No. 23,704, Mar. 26, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,505
Int. Cl.³ B01D *1/26, 3/02*
U.S. Cl. 203—25 **11 Claims**



1. A method for distilling liquids in at least two consecutively disposed distillation units which operate at different respective temperature levels, and wherein said units each include at least two consecutive distillation stages, each stage including an evaporator and associated condenser, and evaporator in one stage adapted to operate at a prevailing pressure which is lower than the prevailing pressure in the preceding stage in the direction of flow of distilling liquid through the evaporators thereof, comprising the steps of:
passing distilling liquid through evaporators of the respective stages of a first preceding distillation unit wherein in each of said stages the distilling liquid is evaporated and the vapor formed directed into the associated condenser of the respective stage of said first preceding distillation unit;
passing distilling liquid through evaporators of the respective stages of a second succeeding distillation unit operating at a lower temperature level than said first preceding distillation unit and wherein the prevailing pressure in

each evaporator is lower than the prevailing pressure in the evaporator in the preceding distilling stage so that the distilling liquid is cooled as it passes through the evaporators of the respective stages, said distilling liquid being at least partially evaporated in each of said stages and wherein the vapor formed is directed into the associated condensers of the respective stages of said second succeeding distillation unit for being condensed therein;

conducting the cooled distilling liquid from the last evaporator of the second succeeding unit into the condensers of said first preceding distillation unit which is operating at a higher temperature level than that of the succeeding unit wherein the cooled distilling liquid in the first preceding distillation unit flows in countercurrent relationship to the distilling liquid passing through the evaporators of said first preceding distillation unit with the cooled distilling liquid passing from the condenser in a distillation stage of said first unit to the condenser in the preceding distillation stage thereof wherein the pressure is higher, said cooled distillation liquid being brought into indirect heat exchange with the vapor which has been directed into the condensors of said first preceding distillation unit so that the cooled distilling liquid from the evaporators of the second succeeding distillation unit acts as a coolant in the condensers of said first preceding distillation unit whereby the vapor present in the condensers of said first preceding distillation unit is condensed to become distillate, said cooled distilling liquid being heated in the preceding unit as it flows in the condensers thereof from a distilling stage to a preceding distilling stage thereof; and

conducting the heated distilling liquid back from the last condenser in the first preceding distillation unit where it acted as a coolant to the succeeding distillation unit operating at a lower temperature level and into the evaporators thereof.

4,348,262

REFINING TETRAHYDROFURAN

Albert M. Stock, LaPorte, and Wilson S. Tse, Houston, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 151,242, May 19, 1980, abandoned. This application May 4, 1981, Ser. No. 259,954

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—37 **4 Claims**

1. A process for refining crude acidic tetrahydrofuran made from acetylene and formaldehyde, the process comprising adding enough base to the crude tetrahydrofuran to bring its pH value to no more than about 11, but in sufficient amount to hinder the formation of methacrolein while inhibiting corrosion therein, and thereafter distilling the thus treated tetrahydrofuran.

4,348,263

SURFACE MELTING OF A SUBSTRATE PRIOR TO PLATING

Clifton W. Draper, Hopewell, N.J., and Satya P. Sharma, Reynoldsburg, Ohio, assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 12, 1980, Ser. No. 186,654

Int. Cl.³ C25D *5/34*; H01H *1/02*

U.S. Cl. 204—29 **15 Claims**

1. A method of making an electrical contact including the step of depositing a protective layer on at least a first portion of a metal substrate characterized by melting at least a second portion of the surface of said substrate with said first portion at least partially overlapping said second portion to a depth of less than 0.1 millimeters by means of an electron beam or laser beam prior to said deposition, wherein the duration of said melting at a given location on said substrate is less than 10 milliseconds, wherein said protective layer comprises at least one metal selected from the group consisting of gold, silver, platinum, ruthenium, rhodium, iridium, and palladium, and wherein said melting substantially reduces the average metallic grain diameter of said surface of said substrate.

4,348,264

PHOTOCATALYZED PROCESS FOR PRODUCING CARBAPENAMS AND CARBAPEN-2-EMS

Robert L. Rosati, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 149,604, May 14, 1980, abandoned. This application Feb. 9, 1981, Ser. No. 232,156

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **30 Claims**

1. A light-catalyzed process of rearranging a 2-diazo-1-oxoceph-3-em-4-carboxylate to a 1-oxocarbapen-2-em-3-carboxylate in a reaction-inert organic solvent in a temperature range of −100° C. to 35° C.

4,348,265

PROCESS FOR THE SELECTIVE ALIPHATIC CHLORINATION OF ALKYLBENZENES

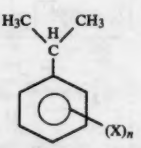
Robert M. Strom, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 27, 1981, Ser. No. 248,599

Int. Cl.³ B01J *19/12*; C07C *17/12*

U.S. Cl. 204—158 HA **12 Claims**

1. A process for the preparation of α-chlorinated cumene derivatives, which comprises contacting a chlorinating agent with a cumene derivative represented by formula I



I

wherein n is a whole number from 1 to 5, and X is a halogen or any electron-withdrawing group which does not react with chlorine, in the presence of a free radical initiator and under conditions sufficient to selectively chlorinate the α carbon of the isopropyl side chain of the cumene derivative, and under such conditions that at least 80 mole percent of the cumene derivative is converted to the corresponding α-chlorocumene derivative or its dehydrochlorinated analogue.

4,348,266

IRRADIATED BLENDS OF POLYETHYLENE AND NEOPRENE RUBBER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 2, 1981, Ser. No. 250,472

Int. Cl.³ C08F *8/00*

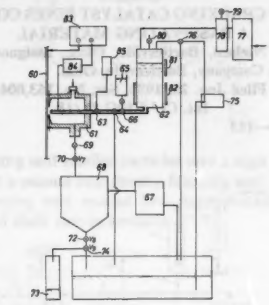
U.S. Cl. 204—159.17 **14 Claims**

1. A composition comprising a blend of about 10–75 parts by weight of crystalline polyethylene, and, correspondingly, about 90–25 parts by weight of neoprene rubber wherein the composition is irradiated with an ionizing radiation dose of about 1 to 15 M Rads.

4,348,267
PLATING MEANS

Kouichi Shimamura, Yokohama, Japan, assignor to Sonix Limited, Kanagawa, Japan

Division of Ser. No. 133,130, Mar. 24, 1980, Pat. No. 4,287,029.
This application Nov. 14, 1980, Ser. No. 206,873
Claims priority, application Japan, Aug. 9, 1979, 54-100772
Int. Cl.³ C25D *17/00, 21/00*
U.S. Cl. 204—206 18 Claims

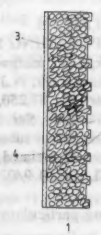


1. A plating means comprising:
(a) a mask having an opening of the same size as a smaller work surface and contacting closely the smaller work surface,
(b) a nozzle for jetting a plating solution which is disposed so as to confront the opening of the mask,
(c) an outer tube enclosing the mask and the nozzle in which is formed a closed space,
(d) an outer air induction means communicated to outer air,
(e) a fluid discharging means for discharging fluid within the closed space,
(f) a power source circuit for supplying electric power of mutually opposing polarity to the work surface and the nozzle respectively,
(g) a gas-liquid separator for separating the plating solution from the fluid withdrawn by the fluid discharging means, and
(h) a plating solution tank associated with the gas-liquid separator and replenished by a reproduced plating solution.

4,348,268
ELECTRODE FOR ELECTROLYSIS OF WATER

Rene Müller, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company, Baden, Switzerland

Filed Jun. 17, 1980, Ser. No. 160,176
Claims priority, application Switzerland, Jun. 29, 1979, 6082/79
Int. Cl.³ C25B *11/12, 1/04;* H01M *4/48*
U.S. Cl. 204—290 R 2 Claims

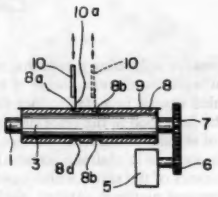


1. A porous electrode for electrolysis of water comprising a plate of porous graphite having one major surface thereof coated with a thin layer comprised of titanium and titanium oxide doped with a catalyst comprising mixture of about 20 mole percent of RuO_2 and about 80 mole percent of IrO_2 totalling 100% the thickness of said layer comprised of titanium and titanium oxide being from 0.1 to 0.5 micrometers, the coated graphite surface and the opposite uncoated graphite surface being exterior surfaces of the electrode.

4,348,269
CARRIER CONVEYING MECHANISM FOR ELECTROPHORETIC APPARATUS

Toshio Sakagami, Chofu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1980, Ser. No. 195,068
Claims priority, application Japan, Oct. 15, 1979, 54-141388[U]
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—299 R 3 Claims



1. A carrier conveying mechanism for electrophoretic apparatus comprising a pair of wide rollers which are arranged on the front and rear sides respectively, of the conveying mechanism, a driving mechanism for rotating said rollers, a wide and thick conveying belt passing over said rollers, a first longitudinally extending groove formed on the surface of said conveying belt, a carrier mounted on said conveying belt and capable of being conveyed by travel of said belt upon rotation of said rollers by said driving mechanism and capable of being stopped at a predetermined position upon stopping of said driving mechanism, and a plurality of sample applicators arranged over and along said first groove and holding a sample at each tip portion thereof, each applicator being capable of applying said sample onto said carrier at a position located over said first groove when said conveying belt has stopped.

4,348,270
CATALYSTS AND HYDROCARBON TREATING PROCESSES UTILIZING THE SAME

Roby Bearden, Jr.; Clyde L. Aldridge, and Lloyd A. Pine, all of Baton Rouge, La., assignors to Exxon Research And Engineering Co., Florham Park, N.J.

Division of Ser. No. 93,698, Nov. 13, 1979, Pat. No. 4,295,996.
This application Mar. 23, 1981, Ser. No. 246,448
Int. Cl.³ C10G *1/06, 47/12, 45/04, 11/02*
U.S. Cl. 208—9 9 Claims

1. A hydrocarbon treating process which comprises contacting a hydrocarbonaceous oil feed at treating conditions with a supported catalyst comprising a composition comprising a metal component, carbon, and hydrogen deposited on a support, the metal constituent of said metal component of said composition being selected from the group consisting of metals of Groups II, III, IV, V, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said composition having a surface area of at least about 50 m^2/g, and said support being an aluminum alloy powder having a surface area of less than about 5 square meters per gram, said alloy having been prepared by atomizing said aluminum alloy, in molten state, into a

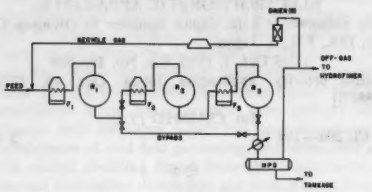
stream selected from the group consisting of water, a gas and mixtures thereof.

4,348,271

CATALYTIC REFORMING PROCESS

George A. Swan, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 14, 1981, Ser. No. 283,167
Int. Cl.³ C10G 45/00
U.S. Cl. 208—89 10 Claims



1. In a process for reforming a naphtha, with hydrogen, in a reforming unit which is a net producer of hydrogen, at least a portion of which is used in a Hydrofiner for hydrodesulfurizing the naphtha feed used in the reforming process, comprised of a plurality of serially connected reactors, inclusive of a lead reactor which contains a platinum catalyst and one or more subsequent reactors of the series which contains a sulfur sensitive metal promoted platinum catalyst, such that naphtha and hydrogen can be contacted with the platinum catalyst of the lead reactor at reforming conditions and the product of said reaction, and the products of subsequent reactions, passed in seratim from one reactor of the series to the next, the product of the final reactor of the series being separated into a hydrogen rich gaseous product and a C_5+ liquid product with a portion of the gas being recycled to the lead reactor and another portion of the gas to said Hydrofiner,

the improvement comprising

bypassing reactors subsequent to said lead reactor during start-up of the reforming unit with the product of said lead reactor,

separating the product of said lead reactor into hydrogen-containing gaseous portions, one of which is fed to said Hydrofiner, and another of which is recycled to said lead reactor, and

passing the product of said lead reactor, after line out of said reforming unit and satisfactory operation of said Hydrofiner in hydrodesulfurizing said naphtha feed to said lead reactor, in seratim from one subsequent reactor of the series to another to produce in the final reactor of the series a high octane C_5+ liquid product, and hydrogen.

4,348,272

HYDROGEN UTILIZATION IN FLUID CATALYTIC CRACKING

Hosheng Tu, Shorewood, Ill., assignor to UOP, Inc., Des Plaines, Ill.

Filed Jul. 21, 1980, Ser. No. 170,373
Int. Cl.³ C10G 47/20, 47/30
U.S. Cl. 208—111 6 Claims

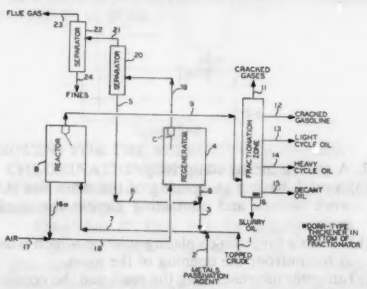
1. A fluidized catalytic cracking process employing a catalyst comprising a crystalline aluminosilicate, the exchangeable cationic sites of which have been ion exchanged with cations of a non-noble transitional metal, said catalyst being cycled between a cracking zone, in which said catalyst is contacted at an elevated temperature with a hydrocarbon feedstock, and a regeneration zone, in which carbon is oxidized and thereby removed from said catalyst, said process comprising subjecting said catalyst, while in transit from said regeneration zone to said cracking zone, to water thermolysis at a temperature from about 900° F. to a maximum thermal stability temperature of said catalyst and a catalyst water content of from about 0.1 wt% to about 5.0%, thereby forming hydrogen which is retained by the catalyst, introducing said hydrogen to said cracking zone with the catalyst, and releasing the hydrogen from the catalyst by contact of the latter with said hydrocarbon feedstock in the cracking zone to effect improved cracking selectivity and reduced coke production.

4,348,273

TREATING CRACKING CATALYST FINES CONTAINING A PASSIVATING MATERIAL

Richard H. Nielsen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 25, 1980, Ser. No. 163,004
Int. Cl.³ C10G 11/18
U.S. Cl. 208—113 7 Claims



1. A process comprising:

(a) cracking a hydrocarbon oil in a cracking zone in the presence of a cracking catalyst; wherein said catalyst becomes contaminated with a contaminant that is a member of the group consisting of vanadium, chromium, iron, cobalt, copper, arsenic, antimony, platinum, bismuth and compounds thereof;

(b) regenerating, in a regeneration zone, said cracking catalyst;

(c) passing from said regeneration zone gas and fines of said catalyst to a first separation zone.

(d) separating, in said first separation zone, coarser fines of said catalyst from finer fines of said catalyst; wherein said finer fines are contaminated with more, on a weight percent basis, of said contaminant than are said coarser fines;

(e) recycling said coarser fines to said cracking zone;

(f) separating, in a second separation zone, said gas from said finer fines; and

(g) treating said finer fines with a stabilizing agent in an amount sufficient to improve the stability of said contaminant against leaching by water; wherein said stabilizing agent is a member of the group consisting of indium, tin and compounds thereof.

4,348,274

OIL SHALE UPGRADING PROCESS

Robert P. Guerre, Seabrook, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

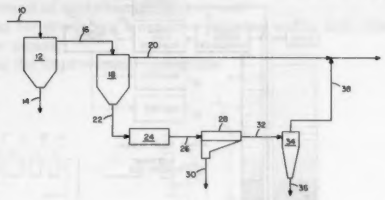
Continuation-in-part of Ser. No. 57,250, Jul. 13, 1979. This application Dec. 24, 1980, Ser. No. 220,205
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.
Int. Cl.³ B03B 9/02
U.S. Cl. 209—2 9 Claims

1. A process for upgrading particulate oil shale which comprises:

(a) removing substantially all particles having a specific gravity greater than a predetermined value from said oil

shale thereby producing a first low density fraction of particles;

(b) crushing or grinding substantially all of said particles comprising said first low density fraction to produce smaller particles;



(c) separating said smaller particles into a high density fraction and a second low density fraction; and

(d) recovering said second low density fraction as high grade oil shale rich in kerogen.

4,348,275

APPARATUS FOR SEPARATING FINE MATERIAL FROM COARSE MATERIAL

Bo G. Backman, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

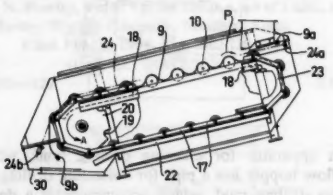
PCT No. PCT/SE79/00064, § 371 Date Nov. 23, 1979, § 102(e) Date Nov. 23, 1979, PCT Pub. No. WO79/00812, PCT Pub. Date Oct. 18, 1979

PCT Filed Mar. 21, 1979, Ser. No. 173,132

Claims priority, application Sweden, Mar. 22, 1978, 7803308

Int. Cl.³ B07B *1/28*

U.S. Cl. 209—310 **9 Claims**



1. In an apparatus for separating fine material from coarse material having an elongated, perforated, non-travelling screen-cloth extending from a feed end toward a discharge end, and travelling support means supporting said screen-cloth and imparting undulating motion thereto, said support means including a plurality of travelling rotatable support members spaced longitudinally with respect to said screen-cloth and extending transversely beneath said screen-cloth, each of said support members contacting portions of the underside of said screen-cloth near the edges thereof and intermediate the edges across the width thereof, while at the same time travelling in a forward direction lengthwise of said screen-cloth toward said discharge end, the improvement comprising means for positively rotating said support members, while they are in contact with said screen-cloth, in a screen-cloth retarding direction toward the feed end to urge all of said contacted portions of the underside of said screen-cloth toward the feed end.

4,348,276

AUTOMATIC TESTING APPARATUS FOR AUTOMATICALLY TESTING A PRINTED CIRCUIT BOARD

Kazushi Tateishi, Kamisatomachi; Kuniaki Anzai, Kumagaya, and Taketoshi Tomita, Chichibu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

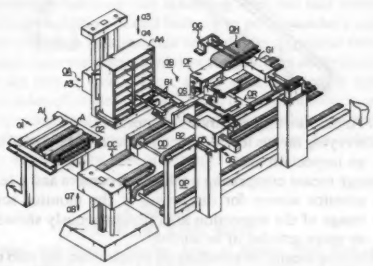
PCT No. PCT/JP79/00173, § 371 Date Jan. 8, 1981, § 102(e) Date Sep. 3, 1980, PCT Pub. No. WO80/02461, PCT Pub. Date Nov. 13, 1980

PCT Filed Jun. 30, 1979, Ser. No. 224,282

Claims priority, application Japan, May 8, 1979, 54-55851; May 8, 1979, 54-55852; May 8, 1979, 54-55853; May 8, 1979, 54-55854; May 8, 1979, 54-55855; May 8, 1979, 54-55856; May 11, 1979, 54-57817; May 11, 1979, 54-57818; May 11, 1979, 54-57821

Int. Cl.³ B07C *5/344*

U.S. Cl. 209—573 **3 Claims**



1. An automatic testing apparatus for automatically testing printed circuit boards, comprising a frame-like pallet (OR) for carrying a printed circuit board; a pallet supply device (OC) for supplying the pallet (OR) to a conveyor (OD) for testing process; a printed circuit board takeout device (OB) for placing the printed circuit board on the pallet (OR) which is supplied to the conveyor (OD); an automatic parts measuring/adjustment means (OI, OK) disposed in a fixed position on a travel path of the printed circuit board (OS) passed through an automatic parts testing apparatus (OF), said automatic parts testing apparatus being disposed on a path of conveyance of the printed circuit board (OS) by the conveyor (OD) and having upper and lower arm tables (**20, 31**) moved such that the printed circuit board (OS) is sandwiched therebetween, said lower arm table (**31**) having a contact pin (**38**) adapted to be contacted with each component part terminal etc. on the printed circuit board (OS), said automatic parts testing apparatus being capable of electrically detecting the respective component part through the contact pin (**38**), said automatic parts measuring/adjustment means (OI, OK) having upper and lower arm tables moved such that the printed circuit board carried at this position is sandwiched therebetween, said lower arm table (**161**) having a contact pin (**168**) adapted to be contacted with the corresponding terminal on the printed circuit board and said upper arm table having at least a driver device (**158**) adapted to be driven to permit it to be fitted into a to-be-adjusted component part on the printed circuit board, said automatic parts measuring/adjustment means being adapted to measure the circuit or component parts while adjusting the to-be-adjusted component part by said driver means (**158**); and sorting means (OG, OJ, OL) disposed in a fixed position on a path of conveyance of the printed circuit board (OS) by said conveyor means (OD) to lift the printed circuit board (OS) to permit it to be transferred to a conveyor (OH) for unfit circuit board if it is at least an unfit circuit board.

4,348,277

ARTICLE SORTING APPARATUS AND METHOD

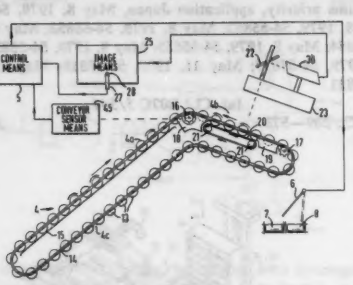
Robert M. Cowlin, Leiston, and Nigel C. Helsby, Maldon, both of England, assignors to Lockwood Graders (UK) Limited, Essex, England

Filed Apr. 21, 1980, Ser. No. 141,927

Claims priority, application United Kingdom, Nov. 6, 1979, 7938336

Int. Cl.³ B07C *9/00*

U.S. Cl. 209—705 **13 Claims**



1. Article sorting apparatus comprising:

conveying means for conveying articles to be sorted through an inspection area;

image means comprising a television camera and a television monitor screen for displaying at the monitor screen an image of the inspection area simultaneously showing two or more articles to be sorted;

selection means for selecting an article from the two or more articles displayed at the monitor screen and for generating signals indicative of the selected article, including a hand-held light pen movable relative to the screen for indicating a location on the screen corresponding to a location of a selected article in the inspection area and for generating a location signal indicative of the location on the screen indicated by the light pen, and switch means positioned on the light pen and operable by touch of pressure of the light pen on the screen to generate at a chosen time a signal indicative of the transient position of the selected article in the inspection area;

deflector means for selectively deflecting articles conveyed by the conveying means; and

control means for actuating the deflector means in dependence upon signals generated by the selection means to effect selective deflection of articles in response to article selection by an operator observing the monitor screen.

4,348,278

SETTLEMENT TANK CONDITION MONITORING SYSTEM

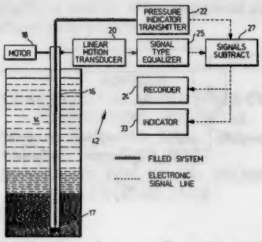
Carl Caccia, 72 Empire Ave., Toronto, Ontario, Canada (M4M 2L4)

Filed Oct. 31, 1980, Ser. No. 202,722

Int. Cl.³ B01D *21/00*

U.S. Cl. 210—86 **4 Claims**

1. A condition monitoring system for use with a settling tank used to receive a mixture of substances including a parent fluid for differential gravitational settlement, said system including; a selectively submersible probe; motor driven means to change the level of the probe end within the tank; continuously operable probe submergence sensing means including a transducer having a static head output signal responsive to the position of said probe end; pressure sensitive head detection means having an output signal responsive to the instantaneous total fluid pressure of said mixture at said probe end; signal conversion means connected to said submergence sensing means having an output equivalent to the partial pressure static head of said parent fluid acting at said probe end, signal subtractor means connected to said conversion means and said head detection means having an output signal responsive to the difference between said total pressure and said partial pressure, and recording means



for recording said difference signal as a characteristic curve of said tank contents.

4,348,279

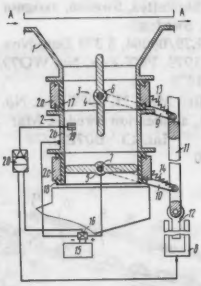
APPARATUS FOR CLEANING DRILLING MUD

Jury P. Tikhonov, Zaiton, 17; Stanislav A. Alekhin, Chilanzar, 24, dom 55, kv. 89; Vitold M. Bakhir, Gaidara, 7a, kv. 17, and Jury G. Zadorozhny, Chilanzar, 2, dom 59, kv. 12, all of Tashkent, U.S.S.R.

Filed Dec. 11, 1980, Ser. No. 215,353

Int. Cl.³ B01D *21/24*

U.S. Cl. 210—96.1 **3 Claims**



1. An apparatus for cleaning drilling mud, wherein a straightflow hopper has a pipe for collecting drillings deposited, from drilling mud, which accommodates a device for removing drillings, characterized in that the device (3) for removing the drillings comprises two shutters (4, 5) provided at the ends of the pipe (2) for collecting the drillings deposited from driling mud, which are operatively connected to one another and coupled to an actuator (8) for turning them for alternately shutting-off the cross-section of the pipe (2).

4,348,280

PROPORTIONING DIALYSIS MACHINE

Richard W. George, Libertyville, and William J. Schnell, Arlington Heights, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 750,028, Dec. 13, 1976, abandoned, which is a continuation of Ser. No. 654,137, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 516,526, Oct. 21, 1974, abandoned. This application Mar. 3, 1980, Ser. No. 126,404

Int. Cl.³ B01D *31/00*; A61M *1/00*

U.S. Cl. 210—101 **13 Claims**

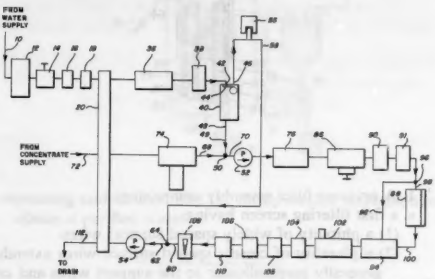
1. A dialysis machine which constantly delivers dialysis

solution to a dialyzer during dialysis, and which includes a degassing system for removal of dissolved and entrained gases from a substantially body temperature liquid said system including:

chamber means for receiving said liquid for treatment and having: liquid inlet means, liquid outlet means in a lower portion of said chamber, and gas outlet means in an upper portion of said chamber means; and

means for producing a negative pressure within said chamber means,

wherein the improvement comprises:



there being provided valve means associated with said chamber means and cooperating with said liquid inlet means for controlling liquid flow into said chamber means and the liquid level within said chamber so as to establish a restricted volume for gas within said chamber;

said means for producing a negative pressure in said chamber being first pump means connected to said gas outlet means for drawing gas from the restricted volume for gas within said chamber; and

said chamber means, valve means and first pump means cooperating to controllably produce negative pressures in said chamber as low as about −700 mm/Hg.

4,348,281

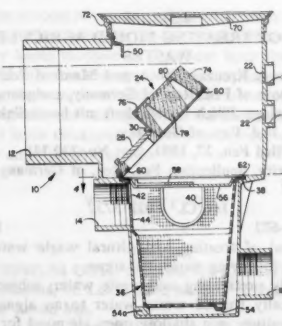
SKIMMER ASSEMBLY FOR SWIMMING POOLS

Stephen J. Perry, Arcadia; Gordon F. Ehret, Alhambra, and William N. Rowley, Palos Verdes Estates, all of Calif., assignors to Marley/Wylain Company, Mission, Kans.

Filed Feb. 2, 1981, Ser. No. 230,517

Int. Cl.³ E04H *3/20*

U.S. Cl. 210—129 **5 Claims**



1. A skimmer assembly for use in swimming pools comprising:

a housing having walls presenting a cavity and further including—structure defining a skimming inlet in communication with said cavity for receiving water from the water line of said pool, structure defining a second inlet in communication with said cavity for receiving water from a level below the water line of said pool, and structure defining an outlet in communication with said cavity for communicating said cavity with a vacuum source for discharging water from said housing; a filter basket disposed in said housing including a generally upright, perforate sidewall structure defining a basket opening; and means for controlling the ratio of the flow of water entering said cavity through said skimming inlet to the flow of water entering said cavity through said second inlet including—a buoyant weir disposed in said housing between said skimming inlet and said outlet and shiftable between an open and closed position for regulating the amount of water entering said housing through said skimming inlet, separate means operatively attached to said basket sidewall presenting respective, spaced apart, flow restricting orifices of different effective flow control dimensions, each orifice being selectively positionable in a location relative to said second inlet for selective control of the volume of water permitted to flow from below the water line of the pool through said second inlet to the outlet via said orifice, means mounting said basket within said housing generally between said skimming inlet and said outlet for selective shifting of said basket to a position where one of said orifices is adjacent said second inlet to restrict flow of water from said second inlet to the cavity in accordance with the size of said orifice, a top wall secured to said basket sidewall structure configured to substantially cover said opening, said top wall defining a water flow aperture therethrough and including a shiftable cover for selectively adjusting the size of the aperture.

4,348,282

OIL-COLLECTING SHIP

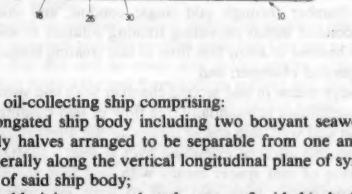
Ortwin Fries, and Claus Lühring, both of Brake, Fed. Rep. of Germany, assignors to C. Lühring-Schiffswerft-Trockendock, Brake, Fed. Rep. of Germany

Continuation of Ser. No. 947,456, Oct. 2, 1978, abandoned. This application Dec. 22, 1980, Ser. No. 218,691

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744517

Int. Cl.³ B63B *35/28*

U.S. Cl. 210—242.3 **10 Claims**



1. An oil-collecting ship comprising:

an elongated ship body including two bouyant seaworthy body halves arranged to be separable from one another generally along the vertical longitudinal plane of symmetry of said ship body;

a movable joint arranged at the stern of said ship body for directly connecting the rearward ends of said body halves so that said body halves can be separated to a stable spread apart condition relative to one another to collect oil on the water surface;

means for skimming the oil from the water surface after the oil has been contained by said body halves when in said spread apart condition;

a first locking device arranged at the forecastle end bulkhead of said ship body for holding said two body halves together in abutting relationship in a closed condition;

at least one main drive arranged at the stern of said ship body for propelling the ship when said two body halves are in said closed condition; and

two auxiliary drive units each arranged at the bow of a different one of said two body halves for separating said two body halves and for propelling the ship when said two body halves are in said spread apart condition.

4,348,283

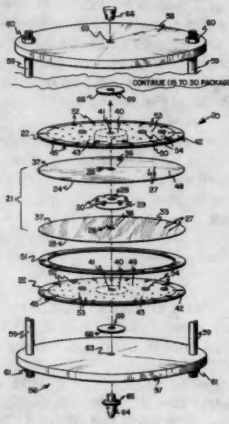
RECIPROCATING DIALYZER HAVING SPACERS

Stephen R. Ash, Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Nov. 5, 1980, Ser. No. 204,342

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.3 **19 Claims**



1. A reciprocating dialyzer apparatus, comprising:

membrane means defining a wall between a first chamber for receiving a fluid to be treated and a second chamber for receiving treating solution with treatment occurring through said wall in the presence of a fluid to be treated and treating solution in contact with opposite sides of said wall;

first and second conduit means for separately providing access for said fluid to be treated to said first chamber and access for said treating solution to said second chamber, said first conduit means being a single conduit for introducing and withdrawing fluid to be treated from said first chamber through said single conduit, and said second conduit means providing treating solution to said second chamber to allow free flow of said treating solution in said second chamber; and

spacer means in said second chamber with said spacer means permitting substantially free flow of said treating solution at said wall, said spacer means having alternating first and second portions extending over at least a substantial portion of said spacer means with said first portions being engageable with said wall to limit movement thereof without creating a block in the other of said chambers and said second portions being recessed from said wall to permit access thereto so that said treatment can occur at said wall, said second portion including a relatively flat pad and said first portion including a plurality of closely spaced first and second groups of protuberances extending from said pad with said second group of protuberances extending from said pad a distance greater than said first group of protuberances but without creating a block in the other of said chambers.

4,348,284

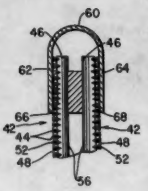
FILTER LEAF CONSTRUCTION

George J. Peer, Mt. Kisco, N.Y., and Robert C. Bradley, Paramus, N.J., assignors to Multi-Metal Wire Cloth Inc., Tappan, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,821

Int. Cl.³ B01D *39/12*

U.S. Cl. 210—486 **20 Claims**



1. A pressure filter assembly comprising:

a. a first filtering screen having:

(1) a plurality of widely spaced support wires,

(2) a plurality of closely spaced surface wires extending generally perpendicular to the support wires and connected thereto along one side of the support wires, said surface wires having a wedge shaped cross-section with the apex of the wedge connected to the support wires and the opposite flat surface of the wedge of each surface wire being disposed in a flat plane with the spacing between each surface wire forming narrow filtering slots extending along said plane;

b. a second filtering screen having the same construction as the first filtering screen;

c. said first and second filtering screens being connected together in opposed relationship with the surface wires of each screen in spaced relation to form an internal chamber and with the flat surfaces thereof facing away from each other and with the support wires of each screen being disposed in said chamber between the surface wires of the screens said chamber being otherwise free of structure;

d. a binder extending around the entire periphery of the two filtering screens and sealing the periphery against flow of fluid therethrough; and

e. a filter outlet connected to the binder and having an opening in communication with said internal chamber.

4,348,285

METHOD OF TREATING LIQUID AGRICULTURAL WASTES

Joost Groeneweg, Kreuzau-Drove, and Manfred Schlüer, Grevenbroich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 239,118

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008127

Int. Cl.³ C02F *3/32*

U.S. Cl. 210—602 **11 Claims**

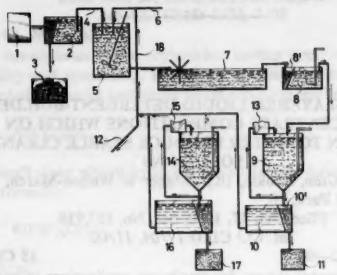
1. A method of treating agricultural waste water which comprises the following sequential steps:

anaerobically pretreating said waste water; subjecting said anaerobically treated waste water to an algae/bacteria mixture culture in a shallow open air pond for approximately 3 to 6 days at a mean temperature of about 18° C.;

controlling and maintaining the pH of said algae/bacteria mixture culture in said pond to a value of at least 8.5 and above to thereby prevent the multiplication of rotifers therein, and to obtain an algae/bacteria suspension;

supplying said algae/bacteria suspension for removal of the algae/bacteria to an aerated rotifer breeding reactor having a rotifer culture therein;

holding said algae/bacteria suspension in said reactor for approximately 2 to 4 days at a mean temperature of about 20° C. and a pH of 6 to 8 for rotifer multiplication;



separating said rotifers from the thusly treated suspension to obtain a purified water.

4,348,286

LARGE SAMPLE THIN LAYER CHROMATOGRAPHY

Herman R. Felton, Wilmington, Del., assignor to Analtech, Incorporated, Newark, Del.

Filed Jul. 17, 1981, Ser. No. 284,515
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—658 3 Claims

1. In the process of resolving the components of a sample on a thin layer chromatogram having an absorbent layer characterized by linear increase in absorbent layer thickness from a thin end to a thicker end opposite, the improvement consisting in placing the sample on the absorbent near the thin end and developing said chromatograph in the direction of increasing absorbent layer thickness, whereby to resolve components of both low and high R_f values.

4,348,287

ZIRCONIUM COMPOUNDS AS FLOTATION AID

Fred W. Jenkins, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed May 26, 1981, Ser. No. 266,775
Int. Cl.³ C02F *1/24*
U.S. Cl. 210—705 18 Claims

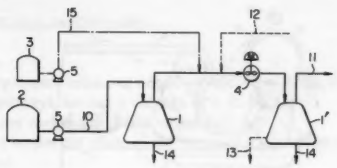
1. A flotation process of clarifying an aqueous system containing oils, solids, or combinations thereof, characterized by the use of a flotation aid selected from the group consisting of water soluble zirconium salts which form zirconium-oxygen bonds in aqueous solution and zirconium-organic compound complexes.

4,348,288

PROCESS FOR DESALTING FUEL OIL

Shoji Yoshinaga; Hirosige Kawano; Matsuzo Todo; Tosihiko Takahasi; Kiyoshi Fujiwara, and Yukio Inoue, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 79,154
Claims priority, application Japan, Sep. 27, 1978, 53-117852; Oct. 27, 1978, 53-131514; Oct. 27, 1978, 53-131519; Jan. 22, 1979, 54-4807
Int. Cl.³ B01D *17/04*
U.S. Cl. 210—708 14 Claims



1. A process for desalting fuel oil, which comprises a separation step of separating fuel oil containing sludges into fuel oil and sludges, without the addition of an emulsion breaker, by a centrifugal separating means, thereby removing the sludges from the fuel oil, and a washing by mixing-separation step of mixing the fuel oil freed from the sludges with water and separating the resulting liquid mixture into fuel oil and water.

4,348,289

WATER TREATMENT METHOD TO REMOVE DISSOLVED OXYGEN THEREFROM

Earl S. Snavely, Jr., Arlington, Tex., and Paul L. Caldwell, Jr., Westport, Conn., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 955,548, Oct. 27, 1978, abandoned.
This application Dec. 29, 1980, Ser. No. 220,327
Int. Cl.³ C02F *1/70;* C01B *17/00*
U.S. Cl. 210—749 7 Claims

1. A method of treating an oxygen-containing water to scavenge the oxygen therefrom and render the water less corrosive, comprising:

(a) firing a sulfur-containing fuel in a flue gas generator to form a flue gas containing sulfur oxides;

(b) flowing said flue gas containing sulfur oxides into a reactor vessel;

(c) flowing an aqueous sodium hydroxide solution into said reactor vessel and into contact with said flue gas to scrub said flue gas and to react said sulfur oxides with said sodium hydroxide and form sodium sulfites and discharging said scrubbed flue gas from said reactor vessel;

(d) injecting ascorbic acid into said reactor vessel in an amount sufficient to inhibit the oxidation of said sodium sulfites to sodium sulfates;

(e) discharging from said reactor vessel said reacted sodium hydroxide solution containing said sodium sulfites and ascorbic acid;

(f) recirculating through said reactor vessel at least a portion of said reacted solution through said reactor vessel to further react with said sulfur oxides;

(g) recovering said sodium sulfites and ascorbic acid; and

(h) injecting said recovered sodium sulfites and ascorbic acid into a water containing oxygen in an amount sufficient to scrub the oxygen from the water but in a sufficiently small amount to dilute said ascorbic acid to a concentration of less than about 0.1 ppm.

4,348,290

METHOD AND DEVICE FOR REMOVING A FLUID FROM A MIXTURE OF A FLUID AND A SOLID SUBSTANCE

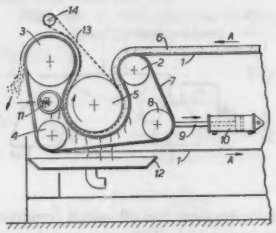
Hendricus H. Schipper, Bunnik, Netherlands, assignor to B.V. Machinefabriek v/h Pannevis & Zn., Netherlands

Filed Jun. 4, 1981, Ser. No. 270,425

Claims priority, application Netherlands, Jun. 25, 1980, 8003667

Int. Cl.³ B01D *33/00*

U.S. Cl. 210—783 **10 Claims**



1. In a method of removing fluid from a mixture of fluid and solid substance wherein said mixture is supported by a conveyor belt, then passed between said belt and at least a portion of an outer circumference of a drum wherein said belt has sufficient tension to compress said mixture against said outer circumference such that said drum is rotated by contact with said mixture, the improvement comprising the steps of:

positively driving said conveyor belt about said drum; and

braking said drum to resist movement of said mixture therepast, thereby creating shear stresses in said mixture and continuously increasing compressive forces of said conveyor belt against said outer circumference of said drum from a point where said mixture first contacts said circumference to a point where said mixture breaks contact with said circumference.

4,348,291

NOVEL PHOSPHORAMIDES, LUBRICATING COMPOSITIONS AND METHOD OF IMPROVING WEAR AND EXTREME PRESSURE CHARACTERISTICS OF LUBRICATING OIL

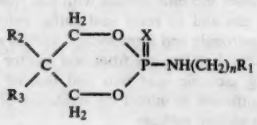
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 2, 1979, Ser. No. 54,126

Int. Cl.³ C10M *1/44*

U.S. Cl. 252—49.9 **7 Claims**

1. The compound of the formula:



wherein:

n is 3 to 8;

R_1 is a mono- or di-alkylamine or alkenyl, having a total of from 8 to 20 carbon atoms;

R_2 and R_3 are each, independently, alkyl of 1 to 3 carbon atoms; and

X is oxygen or sulfur.

6. A lubricating composition comprising a major amount of lubricating oil or grease and a wear or extreme pressure improving amount of the compounds of claims **1, 2, 3, 4** or **5.**

7. A method of improving the wear or extreme pressure lubricating characteristics of a lubricating oil or grease comprising adding to the lubricating oil or grease a wear or extreme pressure improving amount of the compounds of claims **1, 2, 3, 4** or **5.**

4,348,292

MULTI-LAYERED LIQUID DETERGENT-BUILDER CONCENTRATE COMPOSITIONS WHICH ON ADDITION TO WATER PRODUCE STABLE CLEANING SOLUTIONS

Martin E. Ginn, Skokie, Ill., assignor to Walton-March, Inc., Highland Park, Ill.

Filed Oct. 17, 1980, Ser. No. 197,918

Int. Cl.³ C11D *17/04, 11/00*

U.S. Cl. 252—90 **15 Claims**

1. A detergent system for single-use applications in providing a substantially homogeneous aqueous solution or dispersion of predetermined composition to be used for detergent, cleaning, or the like, purposes, comprising a fluid-tight container having at least two separate layers of liquid compositions therein, one of said layers comprising, as an essential ingredient, a predetermined proportion of a concentrate of at least one surfactant which is soluble or readily dispersible in water; and another of said layers comprising, as an essential ingredient, an aqueous solution, in the form of a concentrate, which includes a predetermined proportion of at least one detergent builder; the compositions of said separate layers being of a character such that, if mixed together in their concentrated form, they would be incompatible or immiscible and the resulting mixed composition would be non-homogeneous; said liquid compositions of said separate layers being so related as to the ingredients and proportions thereof that, when essentially all of the liquid contents of the layers in said container are poured into a predetermined proportion of water, a final essentially stable solution or dispersion is obtained in ready-to-use form for the intended detergent, cleaning, or the like, use of the thus finally produced stable solution.

4,348,293

WATER-INSOLUBLE, WATER-PERMEABLE BAG HAVING A WATER-SOLUBLE OR WATER-DISPERSABLE PROTECTIVE LAYER AND CONTAINING A PARTICULATE DETERGENT COMPOSITION

David E. Clarke; James F. Davies, and John B. Tune, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

PCT No. PCT/GB79/00192, § 371 Date Jul. 14, 1980, § 102(e) Date Jul. 14, 1980, PCT Pub. No. WO80/01078, PCT Pub. Date May 29, 1980

PCT Filed Nov. 16, 1979, Ser. No. 198,016

Claims priority, application United Kingdom, Nov. 17, 1978, 45076/78; Nov. 17, 1978, 45078/78

Int. Cl.³ C11D *17/00, 7/54*

U.S. Cl. 252—90 **17 Claims**

1. In a detergent product comprising a particulate detergent composition contained within a closed water-insoluble water-permeable bag formed of sheet material, the improvement which comprises the provision of a layer of water-soluble or water-dispersible material between said particulate detergent composition and said sheet material in an amount effective to protect the bag material from the detergent composition and substantially to prevent dusting-out of the detergent composition through the sheet material when in a dry state.

4,348,294

ONE PACKAGE REPLENISHER FOR ALUMINUM CLEANER

Peter F. King, Farmington Hills, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed Jun. 26, 1980, Ser. No. 163,365
Int. Cl.[3] C11D *1/72, 7/08*
U.S. Cl. 252—142 2 Claims

1. An aqueous acidic replenisher having good temperature stability and containing, as active ingredients, a polyalkylene glycol-abietic acid surfactant having the general formula:

$$A(R'O)_nH;$$

a polyalkylene glycol-hydrocarbon surfactant having the general formula:

$$R(OR')_nOH;$$

wherein:

R is an alkyl or alkylaryl group of 8–22 carbon atoms,

each R' is a divalent radical selected from ethylene, propylene and combinations thereof

each n is an integer from 7 to 22, and

A is the abietic acid radical; fluoride; and sulfuric acid, characterized by having said surfactants present in a combined concentration of from about 10 to about 20% by weight, said fluoride present in a concentration of from about 2 to about 15% by weight and said sulfuric acid present in a concentration of from about 25 to about 50% by weight and being further characterized by having the said active ingredients present in a combined concentration of from about 38 to about 68% by weight.

4,348,295

CRYSTALLINE LITHIUM ALUMINATES

John L. Burba, III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1980, Ser. No. 217,614
Int. Cl.[3] B01D *15/04;* C01D *15/00*
U.S. Cl. 252—184 14 Claims

1. A process whereby crystalline hydrous alumina is converted to crystalline $LiX.2Al(OH)_3.nH_2O$, where nH_2O indicates waters of hydration, and

where X indicates anions which will form acids when in molecular combination with hydrogen or will form salts when in molecular combination with metal ions,

said process comprising reacting the said alumina with a concentrated solution of LiX at an elevated temperature of at least about 85° C.

4,348,296

CRYSTALLINE LITHIUM ALUMINATES

William C. Bauman; John M. Lee, and John L. Burba, III, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1980, Ser. No. 217,611
Int. Cl.[3] B01D *15/04;* C01D *15/00*
U.S. Cl. 252—184 17 Claims

1. A process for growing crystalline hydrous alumina within the pores of a porous substrate, said process comprising

providing a seed of crystalline hydrous alumina in said pores by the in-situ precipitation of soluble Al values, thereby forming amorphous hydrous alumina,

converting the so-formed amorphous hydrous alumina to crystalline hydrous alumina by heating, and

adding to the seed-bearing substrate on aqueous solution of an alkaline aluminate, thereby providing aluminum oxide values which grow additional quantities of crystalline hydrous alumina on the crystalline hydrous alumina seeds.

4,348,297

CRYSTALLINE LITHIUM ALUMINATES

William C. Bauman, and John M. Lee, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 95,692, Nov. 19, 1979, which is a division of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,116,856. This application Dec. 18, 1980, Ser. No. 217,612
Int. Cl.[3] B01D *15/04;* C01D *15/00*
U.S. Cl. 252—184 12 Claims

1. Crystalline lithium aluminates conforming substantially to the empirical formula

$$(LiA_x)_y.2Al(OH)_3.nH_2O$$

where

A represents anions or negative-valence radicals, other than hydroxyl, having a valence of 1, 2, or 3,

x is the reciprocal of the valence of A,

y is a numerical value in the range of about 0.5 to about 1.2, and

n is a value of at least about 1 for waters of hydration.

4,348,298

NEMATIC LIQUID CRYSTAL MIXTURES

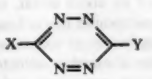
Horst Zaschke; Rudolf Wolff; Gerhard Pelzl, and Dietrich Demus, all of Halle, German Democratic Rep., assignors to VEB Werk fur Fernsehelektronik im Veb Kombinat Mikroelektronik, Berlin-Oberschöneweide, German Democratic Rep.

Continuation-in-part of Ser. No. 46,842, Jun. 8, 1979, abandoned. This application Mar. 31, 1980, Ser. No. 136,036
Claims priority, application German Democratic Rep., Jun. 16, 1978, 206038
Int. Cl.[3] C09K *3/34;* G02F *1/13;* C07D *257/08*
U.S. Cl. 252—299.1 10 Claims

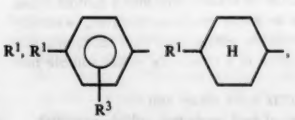
1. A nematic liquid crystal composition for modulation of transmitted or incident light, and for rendition of numerals, symbols, and images in color in electro-optical devices, comprising

(A) a nematic liquid crystal adapted for reorientation in an electric field due to its dielectric anisotropy, and

(B) a dichroic dyestuff adapted for simultaneous orientation with said nematic liquid crystal (A) between a light absorption and a light transmission position based on the guest-host effect, said dichroic dyestuff (B) an s-tetrazine derivative with rod-like molecular structure of the formula



wherein X is



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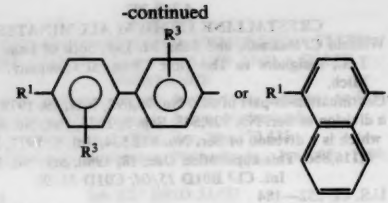
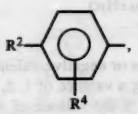


Y is R^2— or



R^1 is H—, F—, Cl—, Br—, I—, O_2N—, NC—, HO—, H_2N, $C_nH_{2n+1}NH$—, $C_nH_{2n+1}(CH_3)N$—, C_nH_{2n+1}—, $C_nH_{2n+1}O$—, $C_nH_{2n+1}S$—, $C_nH_{2n+1}COS$—, $C_nH_{2n+1}COO$—, $C_nH_{2n+1}OOC$—, $C_nH_{2n+1}CO$— or $C_nH_{2n+1}OCOO$—,

R^2 is H—, F—, Cl—, Br—, I—, O_2N—, NC—, HO—, H_2N—, $C_nH_{2n+1}NH$—, $C_nH_{2n+1}(CH_3)N$—, C_nH_{2n+1}—, $C_nH_{2n+1}O$—, $C_nH_{2n+1}S$—, $C_nH_{2n+1}COS$—, $C_nH_{2n+1}COO$—, $C_nH_{2n+1}OOC$—, $C_nH_{2n+1}CO$— or $C_nH_{2n+1}OCOO$—,

R^3 is H—, F—, Cl—, Br—, I—, CH_3— or CF_3—, and

R^4 is H—, F—, Cl—, Br—, I—, CH_3—, or CF_3—,

n is a positive integer.

4,348,299

METHOD FOR PREPARING INORGANIC SULFIDES

Fumio Okamoto, Kamakura, and Katsuhiro Kato, Tokyo, both of Japan, assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 181,945, Aug. 27, 1980, abandoned. This application Nov. 4, 1981, Ser. No. 318,149

Int. Cl.³ C09K *11/465*

U.S. Cl. 252—301.4 S **9 Claims**

1. A method for preparing an inorganic sulfide material consisting essentially of

(a) heating at temperatures between about 800° and 1200° C. a mixture consisting essentially of (i) at least one member of the group consisting of oxidic materials of calcium, strontium and combinations thereof and (ii) a reactive sulfurizing flux which yields alkali metal sulfides and polysulfides upon heating and which is molten between about 800° and 1200° C. and consists essentially of (I) sulfur in elemental form, or as a sulfide of an alkali metal, or a thiosulfate of an alkali metal, and (II) at least one alkali metal as a compound thereof, said compound being thiosulfate, or a carbonate or a hydroxide, said at least one alkali metal being a member selected from the group consisting of sodium, potassium and combinations of at least two of sodium, potassium and lithium, said heating being continued until said flux melts, reacts with said oxidic material and the mixture forms into a molten mass,

(b) cooling said mass to about room temperature whereby relatively water-insoluble particles of said inorganic sulfide material crystallize in a relatively water-soluble matrix,

(c) dissolving said matrix with water and

(d) collecting particles of said inorganic sulfide material.

4,348,300

STABILIZATION OF SODIUM DISPERSION

Robert F. McCartney, Wilmington, Del., and Nicholas Nazarenko, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 28, 1980, Ser. No. 173,098

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—309 **5 Claims**

1. A process for reducing agglomeration of finely divided alkali metal particles which are dispersed in an inert organic liquid which consists essentially of introducing at least about 2.5% by weight based upon the weight of the alkali metal of an aryl halide into said organic liquid before the dispersion reaches a condition where agglomeration can occur.

4,348,301

PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN AN AQUEOUS MEDIUM

Charles E. Crompton, Arlington Heights, Ill.; Abdulla M. Z. Kazi, Euclid, and Inderjit S. Soni, Bedford Heights, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 605,607, Aug. 18, 1975. This application Aug. 10, 1976, Ser. No. 713,155

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—313 R **22 Claims**

1. A process for making a colloidal dispersion of hydrous antimony pentoxide particles comprising introducing a particulate antimony component selected from the group consisting of, oxidizable antimony oxides and mixtures thereof into an essentially aqueous medium which contains no stabilizers and contacting said antimony component with hydrogen peroxide in the aqueous medium at a temperature of from about 0° C. to about the decomposition temperature of the reaction mixture for a length of time sufficient to convert at least a portion of the antimony component to colloidal particles of hydrous antimony pentoxide.

12. A process for making a colloidal dispersion of hydrous antimony pentoxide particles comprising introducing a particulate antimony component selected from the group consisting of oxidizable antimony oxides and mixtures thereof into a dispersion medium which is essentially aqueous, said dispersion medium containing a stabilizing amount of a component selected from the group consisting of alkanolamines, alkanolamine salts, aliphatic alphahydroxy carboxylic acids, and aliphatic polyhydroxy alcohols having vicinal hydroxyl groups, contacting said antimony components with hydrogen peroxide in said dispersion medium at a temperature of from about 0 degrees centigrade to about the decomposition temperature of the reaction mixture for a length of time sufficient to convert at least a portion of the antimony component to colloidal particles of hydrous antimony pentoxide.

4,348,302

ANTICORROSIVE AGENT STABLE TO HARD WATER

Horst Fröhlich, Eppstein, and Rainer Helwerth, Eschborn, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

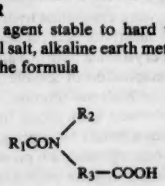
Filed Sep. 29, 1980, Ser. No. 191,677

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940258

Int. Cl.³ C23F *11/14, 11/12*; C07C *79/40*

U.S. Cl. 252—389 R **2 Claims**

1. Anticorrosive agent stable to hard water, which comprises an alkali metal salt, alkaline earth metal salt, or amine salt of a compound of the formula



in which

R_1 is branched C_6–C_{13}-alkyl or C_5- or C_6-cycloalkyl, or polycycloalkyl having from 6 to 13 carbon atoms optionally substituted by 1 or 2 C_1–C_4-alkyl groups,

R_2 is hydrogen or C_1–C_6-alkyl, and

R_3 is C_1–C_{11}-alkylene having a linear or branched chain.

2. Anticorrosive agent stable to hard water consisting substantially of a 0.5 to 10 weight % aqueous solution, dispersion or emulsion of the compound as claimed in claim 1.

4,348,303

CATALYST FOR HYDRAZINE DECOMPOSITION

Philip J. Birbara, Windsor Locks, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 82,291, Oct. 20, 1970, Pat. No. 4,324,819. This application May 18, 1981, Ser. No. 264,509

Int. Cl.³ B01J *23/46, 23/68, 23/88*

U.S. Cl. 252—447 **8 Claims**

1. A catalyst for decomposing hydrazine-base monopropellants, and capable of restarting the decomposition reaction once an initial flow of monopropellant has been terminated, said catalyst comprising:

(a) a high surface area carrier material; and

(b) ½ to 8% by weight of active iridium, ruthenium, or mixtures thereof, based on the total weight of catalyst, deposited on the exterior surface only of the carrier.

4,348,304

CRACKING PROCESS AND CATALYST FOR SAME

John S. Roberts; Brent J. Bertus, and Dwight L. McKay, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 26,504, Apr. 3, 1979, Pat. No. 4,256,564. This application Nov. 21, 1980, Ser. No. 209,076

Int. Cl.³ B01J *29/06, 23/08*

U.S. Cl. 252—455 Z **18 Claims**

1. A cracking catalyst composition comprising a zeolite-containing cracking catalyst containing at least one modifier selected from the group consisting of elemental indium and indium compounds free of the element antimony, said modifier being present in an amount sufficient to reduce the deleterious effect that nickel, vanadium, iron, copper, and/or cobalt have on the activity of said cracking catalyst.

4,348,305

LIQUID DETERGENT COMPOSITIONS COMPRISING MIXTURES OF ALKYL POLYGLYCOL ETHERS AND QUATERNARY AMMONIUM FABRIC SOFTENING AGENTS

Manfred Hennemann, Hilden, and Albrecht Löhr, Ratingen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 32,467, Apr. 23, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,503

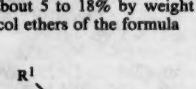
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1978, 2817834

Int. Cl.³ C11D *1/835, 1/62;* D06M *13/46*

U.S. Cl. 252—542 **17 Claims**

1. A liquid detergent having an optimum combination of washing ability, fabric softening action, and sudsing behavior, said liquid detergent comprising:

(a) from about 5 to 18% by weight of a mixture of alkyl polyglycol ethers of the formula



(I)

wherein R^1 represents a linear alkyl radical; R^2, in from about 20 to 75% of said alkyl polyglycol ethers, represents a C_1 to C_4 alkyl group and, in from 25 to 80% of said alkyl polyglycol ethers, represents a hydrogen atom, the total number of carbon atoms in R^1 and R^2 together being from about 11 to 15; and wherein n represents an average value of from about 5 to 9, n being a value such that the ethylene oxide portion of the alkyl polyglycol ether represents from about 50 to 65% by weight, based on the total weight of the alkyl polyglycol ether;

(b) from about 5 to 18% by weight of a mixture of alkyl polyglycol ethers of Formula I, wherein R^1 represents a linear alkyl group; R^2 is a hydrogen atom or, in from about 20 to 75% of said alkyl polyglycol ethers, represents a C_1 to C_4 alkyl group and, in from about 25 to 80% of said alkyl polyglycol ethers, represents a hydrogen atom, the total number of carbon atoms in R^1 and R^2 together being from about 6 to 10; and wherein n represents an average value of from about 3 to 8, n being of such a value that the ethylene oxide portion of the alkyl polyglycol ether represents from about 55 to 70% by weight, based on the total weight of the alkyl polyglycol ether, the quantitative ratio of (a) to (b) being from about 2:1 to 1:2; and

(c) from about 2.5 to 10% by weight of a fabric-softening quaternary ammonium salt.

8. The liquid detergent composition of claim 1 wherein component (c) is a derivative of ammonia or imidazoline.

4,348,306

FLAME RETARDANTS

Vladimir Mischutin, Union City, N.J., assignor to White Chemical Corporation, Bayonne, N.J.

Division of Ser. No. 797,767, May 17, 1977, Pat. No. 4,158,077, which is a division of Ser. No. 538,896, Jan. 6, 1975, abandoned, which is a division of Ser. No. 300,732, Oct. 25, 1972, abandoned. This application Apr. 18, 1979, Ser. No. 31,307

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.³ C09K *3/28*

U.S. Cl. 252—608 **11 Claims**

5. As a new product, an aqueous medium composition having the ability to impart flame retardant characteristics to synthetic organic textile materials, which comprises by weight:

a water-insoluble solid organic brominated compound, in an amount from about 50% to 75%,

a wetting agent for the organic brominated compound, in an amount from about ¼% to about 2.5%,

a protective colloidal material, in an amount from 1% to 5% and,

a water medium wherein the brominated organic compound is suspended in finely divided form, with substantially all of said particles under 2 microns in diameter.

4,348,307

SEALING MATERIALS FOR ELECTRICAL AND OPTICAL COMMUNICATION CABLES AND CABLE CONNECTORS

Bjoern Noethe, Ebersberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 65,961, Aug. 13, 1979, abandoned. This application Dec. 2, 1980, Ser. No. 212,321

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1978, 2847387

Int. Cl.³ C08K *5/05*

U.S. Cl. 528—49 **1 Claim**

1. A sealing material based on polyurethane for longitudinal sealing of electrical and optical communication cables and cable connectors, comprised of a substantially uniform mixture consisting essentially of:

a first component (A) formed of a material selected from the group consisting of polyester-polyether-polyol with an equivalent weight of about 350, a viscosity of about 2500 mPa.sec at 25° C. and a density of about 0.95 g/ml at 20°

C. and anhydrous caster oil, said material being mixed with dibutyl tin dilaurate;

a second component (b) consisting of hexamethylene-1, 6-diisocyanate; and

a third component (C) consisting of 2-octyldodecanol.

4,348,308

ORTHO-SUBSTITUTED ARYL PHOSPHITE ADDITIVE COMPOSITION

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki, and Kazumi Kitsukawa, Misato, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Saitama, Japan

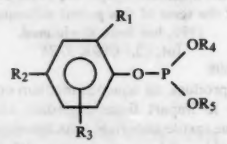
Continuation of Ser. No. 50,320, Jun. 20, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,165

Claims priority, application Japan, Jun. 20, 1978, 53-75041

Int. Cl.³ C08K *5/09, 5/15, 5/52*

U.S. Cl. 524—110 **18 Claims**

1. In an additive composition for improving the color stability upon heating at 175° C. of a vinyl chloride polymer composition stabilized with environmentally acceptable stabilizers only, said stabilizer comprising at least one salt of a non-nitrogenous mono-carboxylic acid having 6 to 24 carbon atoms or a phenol having 6 to 36 carbon atoms with at least one of the metals Li, Na, K, Zn, Ba, Ca, Mg, and Sr, and said additive composition comprising a dehydroacetic acid compound, which is a sodium, potassium, lithium, magnesium, zinc, barium, calcium, tin, or strontium salt of dehydroacetic acid, or dehydroacetic acid, and an organic phosphite, the improvement in which the organic phosphite has the formula:

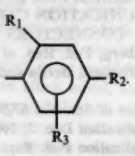


wherein

each of R_1 and R_2 independently is selected from t-butyl and t-amyl;

R_3 is hydrogen or methyl; and

each of R_4 and R_5 independently is selected from hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl having 5 to 20 carbon atoms, aryl having 6 to 12 carbon atoms, aralkyl having 7 to 12 carbon atoms, alkaryl having 7 to 18 carbon atoms, ether-substituted-groups having 3 to about 80 carbon atoms, and 1 to about 40 ether oxygen atoms; and



11. A vinyl chloride polymer composition containing not more than 10 mg of arsenic, beryllium, cadmium, lead, mercury, and thallium combined per kg of vinyl chloride polymer and having improved color stability at 175° C. comprising a vinyl chloride polymer, at least one salt of a non-nitrogeneous monocarboxylic acid having 6 to 24 carbon atoms or a phenol having 6 to 36 carbon atoms with at least one of the metals lithium, sodium, potassium, zinc, barium, calcium, magnesium, and strontium, and a color improving additive composition according to claim **1**.

4,348,309

PREPARATION OF VINYL ESTER RESIN POLYMER SPHERES

Warren W. Pruess, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1980, Ser. No. 195,564

Int. Cl.³ C08K *5/05*

U.S. Cl. 523—336 **10 Claims**

1. A process for preparing a slurry of macrospherical thermoset resin particles which comprises:

(a) making a polyphase mixture by stirring (1) an aqueous phase containing at least 0.25 weight percent polyvinyl alcohol into (2) a vinyl ester resin phase containing a free-radical polymerization catalyst to form an initial water-in-resin emulsion which inverts to a resin-in-water emulsion, said vinyl ester resin being a terminally unsaturated reaction product of an epoxide and a compound containing a group which is reactive with the epoxide, and

(b) adding a promoter and

(c) then curing the resin particles while the mixture is stirred.

4,348,310

SOLUTIONS OF SULFONYL FLUORIDE COMPOUNDS AND FLUOROPOLYMERS

Raimund H. Silva; Paul R. Resnick, both of Wilmington, Del., and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 79,173, Sep. 26, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,595

Int. Cl.³ C08K *5/42, 5/10*

U.S. Cl. 524—167 **13 Claims**

1. A solution of fluoropolymer in halogenated solvent wherein: the fluoropolymer is present in an amount greater than 0.5 percent, by weight, of the solution at 25° C.; the solvent is a perhalogenated, saturated liquid having at least one alkyl segment, at least one alkyl ether segment, and at least one terminal sulfonyl fluoride polar group wherein the halogens in the liquid are selected from the group consisting of F, Cl, Br and I, and the alkyls have one to three carbon atoms; and the fluoropolymer is a copolymer of tetrafluoroethylene and perfluorinated sulfonyl fluoride- or carboxyl-containing vinyl monomer having an equivalent weight of greater than 1000.

4,348,311

COUPLING AGENT COMPOSITIONS FOR COUPLING AN ELASTOMER TO A FILLER AND ELASTOMER/FILLER COMPOSITIONS CONTAINING SAME

Jean Machurat, Neuville sur Saone; Jean-Claude Morawski, Chassieu, and Gerard Soula, Meyzieu, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 11, 1981, Ser. No. 233,459

Claims priority, application France, Feb. 25, 1980, 80 04037

Int. Cl.³ C08K *3/30;* **C09C** *3/10;* **C08K** *5/34;* **C08L** *21/02*

U.S. Cl. 524—530 **23 Claims**

1. An improved elastomeric composition of matter comprising a natural or SBR rubber, an inorganic filler, and a coupling agent for coupling said rubber to said filler, said coupling agent comprising at least one silane and at least one alkenyl succinimide.

4,348,312

ULTRA-HIGH-INDEX GLASS MICROSPHERES AND PRODUCTS MADE THEREFROM WITH A FLUOROPOLYMER AND AN ESTER POLYMER BLEND

Chi F. Tung, Mahtomedi, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 129,077, Mar. 10, 1980, abandoned, which is a division of Ser. No. 962,324, Nov. 20, 1980, Pat. No. 4,192,576. This application Mar. 11, 1981, Ser. No. 242,550

Int. Cl.³ C08K *3/40;* C08L *27/16, 33/12*

U.S. Cl. 428—144 5 Claims

1. Retroreflective film comprising a layer in which glass microspheres are at least partially embedded, said layer comprising a transparent blend of 1 to 99 weight-parts of a copolymer that comprises about 3 parts of methylmethacrylate and 1 part of ethyl acrylate and 99 to 1 weight-parts of a copolymer that comprises about 3 parts of vinylidene fluoride and 1 part of hexafluoropropylene.

4,348,313

CONCRETE FORMULATION COMPRISING POLYMERIC REACTION PRODUCT OF SULFUR/CYCLOPENTADIENE OLIGOMER/DICYCLOPENTADIENE

William C. McBee, and Thomas A. Sullivan, both of Boulder City, Nev., assignors to The United States of America as represented by the Secretary of the Department of Commerce, Washington, D.C.

Continuation-in-part of Ser. No. 85,450, Oct. 16, 1979, Pat. No. 4,311,826. This application Oct. 14, 1980, Ser. No. 196,172

Int. Cl.³ C08F *28/02;* C08K *3/06*

U.S. Cl. 524—788 7 Claims

1. A sulfur concrete formulation, comprising:

an admixture of (a) at least one concrete aggregate, and (b) the polymeric reaction product of (1) sulfur with (2) a modifier, said modifier being a blend of a cyclopentadiene oligomer mixture and dicyclopentadiene, said oligomer mixture being free from dicyclopentadiene, wherein the cyclopentadiene oligomer mixture is at least 37 weight % of the blend, said polymeric reaction product having a softening point of no more than 116° F.

4,348,314

PRODUCTION OF THERMALLY STABILIZED POLYESTER WITH ALKYLENE CARBONATES AND SODIUM OR POTASSIUM THIOCYANATE

Stanley D. Lazarus, Petersburg, and Robert A. Lofquist, Richmond, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 2, 1980, Ser. No. 155,375

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—439 9 Claims

1. A high molecular weight linear polyester stabilized against thermal degradation comprising a polyester reacted with a thermally stabilizing amount of an alkylene carbonate having a 5 or 6 membered ring in the presence of a catalytic amount of a compound selected from the group consisting of sodium thiocyanate, potassium thiocyanate or mixtures thereof.

4,348,315

PROCESS IN PURIFICATION AND CONCENTRATION OF THE FACTOR VIII-COMPLEX

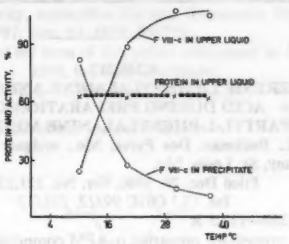
E. G. Birger Blombäck, and Lars G. Thorell, both of Karolinska Institutet, S-10401 Stockholm, Sweden

Filed Dec. 11, 1980, Ser. No. 215,530

Claims priority, application Sweden, Dec. 20, 1979, 7910527

Int. Cl.³ A23J *1/06*

U.S. Cl. 260—112 B 13 Claims



1. A process for purifying and/or concentrating the factor VIII complex comprising the steps of:

(1) dissolving a composition containing factor VIII complex together with impurities therein in glycine to form a solution of at least 1.5 M at a temperature of at least +15° C. and a pH of about 6.3–7.8 to form a solution containing factor VIII and a precipitate containing the impurities; and

(2) recovering the supernatant fluid containing the factor VIII complex.

4,348,316

NEW PROTEIN PP_{15}, A PROCESS FOR ITS PREPARATION AND ITS USE

Hans Bohn, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 220,848

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1979, 2952792

Int. Cl.³ A61K *35/50, 39/395;* C07G *7/00*

U.S. Cl. 260—112 R 5 Claims

1. A protein, PP_{15}, extracted from placental tissue, having

(a) a carbohydrate content of 3.35±0.9%, consisting of 2.8±0.5% of hexoses, 0.3±0.2% of hexosamines, 0.05±0.05% of fucose, and 0.20±0.5% of neuraminic acid;

(b) a sedimentation coefficient $S_{20}{}^{0}{}_{,w}$ of 2.9±0.2 S;

(c) a molecular weight of 30,700±3,200, determined in an ultracentrifuge;

(d) a extinction coefficient $E_1{}^{1\%}{}_{cm}$ (280 nm) of 14.2±1.0,

(e) an electrophoretic mobility within the range of that of albumin,

(f) an isoelectric point of 4.4±0.1, and the following amino acid analysis:

Amino Acid	Mol %	Coefficient of Variation (%)
Lysine	4.74	3.30
Histidine	3.81	5.43
Arginine	1.62	3.43
Aspartic acid	13.39	5.08
Threonine	3.85	5.35
Serine	6.38	2.81
Glutamic acid	13.43	5.32
Proline	4.35	14.25
Glycine	6.87	2.13
Alanine	6.51	8.26
Cystine ½	2.48	4.55

-continued

Amino Acid	Mol %	Coefficient of Variation (%)
Valine	2.29	15.67
Methionine	2.87	10.86
Isoleucine	8.39	8.18
Leucine	8.18	6.72
Tyrosine	2.09	8.49
Phenylalanine	6.27	2.27
Tryptophan	2.51	6.81

4,348,317

RECOVERY OF L-PHENYLALANINE AND L-ASPARTIC ACID DURING PREPARATION OF α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Gerald L. Bachman, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1980, Ser. No. 221,128
Int. Cl.³ C07C 99/12, 103/52
U.S. Cl. 260—112.5 R 20 Claims

1. In a process for preparing α-APM comprising reacting an N-protected-L-aspartic anhydride and L-phenylalanine to form the α- and β-isomers of N-protected L-aspartyl-L-phenylalanine, separating α-L-aspartyl-l-phenylalanine, removing the N-protecting group to afford α-L-aspartyl-L-phenylalanine, esterifying said α-L-aspartyl-L-phenylalanine in aqueous, methanolic hydrogen halide to afford a precipitate of the hydrogen halide salt of α-APM and neutralizing said hydrogen halide salt of α-APM to afford α-APM, said process including separation and washing steps resulting in sidestreams, the improvement comprising recovering L-phenylalanine and L-aspartic acid from at least one of said sidestreams by a process comprising acidifying said sidestream to afford a first solution containing L-aspartic acid and a salt of L-phenylalanine and from which solution the salt of L-phenylalanine precipitates and is removed, forming a second solution by dissolving said removed salt of L-phenylalanine in a solvent therefor and adjusting the pH of said second solution to precipitate L-phenylalanine and adjusting the pH of said first solution to precipitate L-aspartic acid.

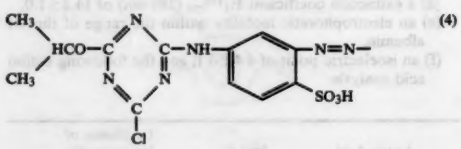
4,348,318

AZO-DYES, THEIR PREPARATION AND USE

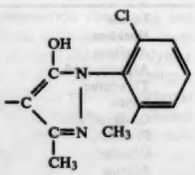
Edmond Ruhlmann, Saint-Louis, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 21, 1979, Ser. No. 96,595
Claims priority, application Switzerland, Nov. 30, 1978, 12254/78
Int. Cl.³ C07C 107/04; C09B 62/085
U.S. Cl. 260—153 1 Claim

1. The azo dye of the formula



(4)



4,348,319

PROCESS FOR THE PREPARATION OF CYANO-AZO DYESTUFFS

Rainer Hamprecht, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 776,411, Mar. 10, 1977, abandoned. This application Jan. 7, 1981, Ser. No. 223,064
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610675
Int. Cl.³ C07C 107/04, 107/06; C09B 43/00
U.S. Cl. 260—208 11 Claims

1. A process for the preparation of an azo compound which, in the diazo component, contains at least one cyano group in the ortho-position relative to the azo bridge, consisting essentially of reacting the corresponding ortho-halogeno-azo dyestuff with copper-I cyanide or with a metal cyanide of the formula

$$Me_pCu(CN)_{p+1} \text{ or } Me_qZn(CN)_{q+2}$$

in which

Me is an alkali metal;

p is 1, 2 or 3; and

q is 1 or 2

in a reaction medium consisting essentially of water or water plus water-immiscible organic solvent and a phase transfer catalyst.

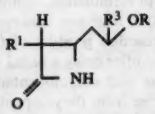
4,348,320

SUBSTITUTED AZETIDIONES

F. Aileen Bouffard, Scotch Plains; Burton G. Christensen, Metuchen, and David B. R. Johnston, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 920,417, Jun. 29, 1978, abandoned, which is a continuation of Ser. No. 743,370, Nov. 19, 1976, abandoned. This application Aug. 20, 1980, Ser. No. 179,922
Int. Cl.³ C07D 205/08, 487/04
U.S. Cl. 260—239 A 6 Claims

1. The compound having the formula



wherein R is hydrogen, acetyl, bromo-t-butoxy carbonyl, benzyloxycarbonyl, formyl, trifluoroacetyl, trimethylsilyl, or t-butyl dimethylsilyl;

R^1 and R^3 are independently selected from the group consisting of hydrogen; alkyl of 1–6 carbon atoms; or the group

wherein R is as defined; phenylalkyl, the alkyl chain of which is 1–6 carbon atoms; and phenyl.

4,348,321

RECRYSTALLIZATION OF PHOSMET

Joe D. McDaniel, Jr., Dallas, and Paul L. Pruitt, Carrollton, both of Tex., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 14, 1980, Ser. No. 206,916
Int. Cl.³ C07D 209/34
U.S. Cl. 260—326 E 8 Claims

1. A process for the recrystallization of phosmet which comprises: preparing a mixture of phosmet with toluene and methanol; agitating and heating said mixture to form a hot

solution; cooling said solution with agitation until the phosmet is recrystallized; and filtering said cooled solution to collect said recrystallized phosmet, said recrystallized phosmet characterized by the absence of offensive mercaptan type odor and said toluene and methanol being present within the ratio of 1:2.5 to 1:1, by weight.

4,348,322

DIOXOLANE DERIVATIVES

Philip N. Edwards, and David M. G. Martin, both of Stockport, England, assignors to Imperial Chemical Industries Limited, London, England

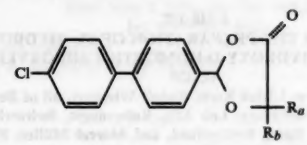
Filed Mar. 11, 1981, Ser. No. 242,529

Claims priority, application United Kingdom, Apr. 3, 1980, 8011378

Int. Cl.³ C07D *317/34*

U.S. Cl. 549—296 **4 Claims**

1. A 2-biphenylyl-1,3-dioxolan-4-one of the formula:



I

wherein R_a is hydrogen or a (1–4 C)alkyl radical, and R_b is a (1–4 C)alkyl radical or a phenyl radical optionally bearing a halogeno radical.

4,348,323

INTERMEDIATES AND DERIVATIVES THEREOF

Rainer Fuchs, Wuppertal; Erich Klauke, Odenthal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath; Wilhelm St-Noel, Wuppertal; Reinhard Lantzsch, and Albrecht Harhold, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

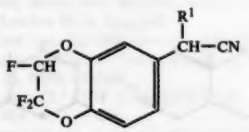
Division of Ser. No. 64,253, Aug. 6, 1979, Pat. No. 4,284,643. This application Jan. 19, 1981, Ser. No. 226,289

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837524; Oct. 14, 1978, 2844816

Int. Cl.³ C07D *319/20*

U.S. Cl. 549—362 **3 Claims**

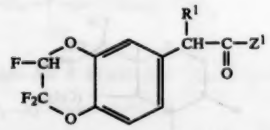
1. A compound of the formula



in which

R^1 is hydrogen or isopropyl.

2. A compound of the formula



in which

R^1 is hydrogen or isopropyl, and

Z^1 is halogen, OH or OC_{1-4}-alkyl.

4,348,324

LIQUID CRYSTALLINE SUBSTITUTED 1,3-DIOXANES AND MIXTURES CONTAINING THESE

Dietrich Demus; Horst Zaschke, both of Halle; Hans-Mathias Vorbrodt, Quedlinburg; Horst Kresse, and Wolfgang Weissflog, both of Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik im Veb Kombinat Mikroelektronik, Berlin-Oberschöneweide, German Democratic Rep.

Filed Dec. 12, 1979, Ser. No. 102,944

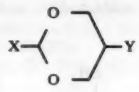
Claims priority, application German Democratic Rep., Dec. 13, 1978, 209707; Dec. 13, 1978, 209708

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ C09K *3/34*; G01F *1/13*; C07D *319/06, 319/04*

U.S. Cl. 549—369 **40 Claims**

1. A compound of the general formula:



wherein X = R^1 and Y = R^2, or

X = R^4 and Y = R^3 or

X = R^1 and Y = R^3 and

where R^1 = C_nH_{2n+1}; $C_nH_{2n+1}O$; $C_nH_{2n+1}COO$;

$C_nH_{2n+1}OCOO$; F; Cl; Br; OH;

R^2 = C_nH_{2n+1}; OOC R^1;

R^3 = C_nH_{2n+1}; $C_nH_{2n+1}O$; CF^3; CN; NO_2;

R^4= C_nH_{2n+1}, and n = 1 to 10,

4,348,325

METHYL 3-AZIDO-4-C-CYANO-2,3,4,6-TETRADEOXY-α-D-ARABINO-HEXOPYRANOSIDE

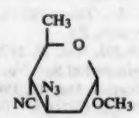
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1981, Ser. No. 248,178

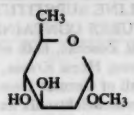
Int. Cl.³ C07D *309/14*

U.S. Cl. 549—419 **3 Claims**

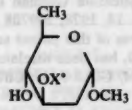
1. A process for preparing:



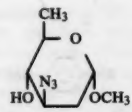
comprising the steps of treating



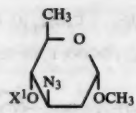
with an activating agent to yield



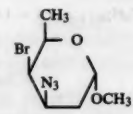
followed by an azidolysis in the presence of an azide selected from lithium azide, sodium azide, potassium azide to yield



followed by treating with an activating agent selected from p-methylphenylsulfonyl chloride, trifluoromethanesulfonic anhydride, methanesulfonyl chloride, p-bromophenylsulfonyl chloride and p-nitrophenyleneformyl chloride to yield



followed by treating with a brominating agent to yield:



followed with a cyanide reagent; wherein X* is selected from methanesulfonyl, trifluoromethanesulfonyl, p-methylphenylsulfonyl, p-bromophenylsulfonyl; and X' is selected from methanesulfonyl, trifluoromethanesulfonyl, p-methylphenylsulfonyl, p-bromophenylsulfonyl, p-nitrophenylsulfonyl.

4,348,326

SUBSTITUTED 7-OXABICYCLO[2,2,1]HEPTA-2,5-DIENE METHANOLS

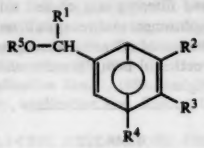
William A. Van Saun, Jr., Titusville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 104,201, Dec. 17, 1979, Pat. No. 4,239,773, which is a continuation-in-part of Ser. No. 11,334, Feb. 12, 1979, abandoned. This application Aug. 11, 1980, Ser. No. 176,736

Int. Cl.³ C07D *307/00*

U.S. Cl. 549—463 **3 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, an ethynyl group, a cyano group, a haloalkyl group, an aminocarbonyl group, or an aminothioxomethyl group; R^2 and R^3, the same or different, are nitro, halogen, cyano, lower alkyloxycarbonyl, lower alkylsulfinyl, lower alkylsulfonyl, or the group $-CONR^6R^7$ or $-SO_2NR^6R^7$ where R^6 and R^7 are independently hydrogen, lower alkyl, or halo(lower)alkyl; R^4 is phenyl, benzyl or benzoyl, optionally substituted with halogen or lower alkyl; and R^5 is hydrogen.

4,348,327

PROCESS FOR THE PREPARATION OF 17α-HYDROXY- AND 17Aα-HYDROXY-D-HOMOETIOCARBOXYLIC ACIDS

Robert Nickolson; Ulrich Kerb; Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany; Leo Alig, Kaiseraugst, Switzerland; Andor Fürst, Basel, Switzerland, and Marcel Müller, Frenkendorf, Switzerland, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

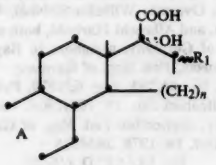
Filed Jun. 23, 1981, Ser. No. 276,563

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3024008

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.1 **10 Claims**

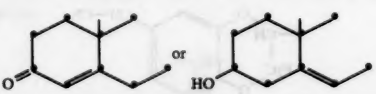
1. A process for preparing a 17α-hydroxy- or 17aα-hydroxy-D-homoetiocarboxylic acid of the formula



wherein

n is 1 or 2,

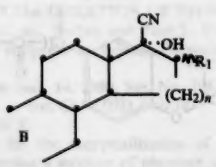
A is



and

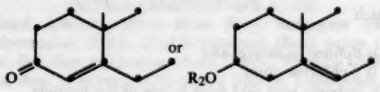
R_1 is H or CH_3,

comprising hydrating the corresponding nitrile of the formula



wherein

R_1 and n are as defined above and B is



wherein R_2 is hydrogen or C_{1-6} alkanoyl, with a mixture of a lower alkane carboxylic acid and its anhydride in the presence of perchloric acid,

and subsequently treating the thus-formed 17β-N-acylcarboxamide in a polyhydric alcohol with an alkali metal hydroxide at a temperature of 100° C. or higher.

4,348,328

25-SUBSTITUTED-5α-CHOLESTANE-3β,22S-DIOL

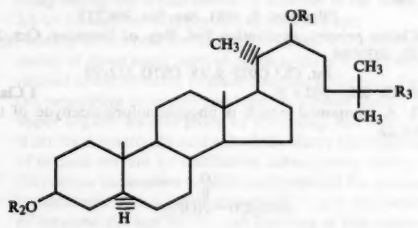
Robert J. Chorvat, Arlington Heights, Ill., assignor to G.D. Searle & Co., Skokie, Ill.

Filed Nov. 9, 1981, Ser. No. 319,519

Int. Cl.³ C07J 9/00

U.S. Cl. 260—397.2 **9 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are:

(a) hydrogen; and

(b) an esterifying moiety of the formula HO—C(O)—$(CH_2)_n$—C(O)—; R_1 and R_2 each being the same or different;

wherein n is an integer from 1 to 3;

wherein R_3 is:

(a) halogen

(b) alkyl of 1 to 6 carbon atoms inclusive.

4,348,329

BIOCOMPATIBLE SURFACES

Dennis Chapman, Royal Free Hospital School of Medicine, 8, Hunter St., London WC1, England

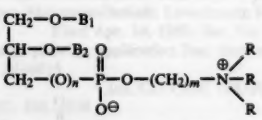
Filed Dec. 22, 1980, Ser. No. 218,556

Claims priority, application United Kingdom, Dec. 20, 1979, 7943936; Oct. 15, 1980, 8033221

Int. Cl.³ C07F 9/02; A23J 7/00

U.S. Cl. 260—403 **8 Claims**

1. A conjugated di-yne of the general formula:



wherein at least one of B_1 and B_2 is a group of the formula

$$-(CO)_p-X_1-C\equiv C-C\equiv C-Y_1$$

wherein p is 0 or 1, X_1 is a direct bond or a divalent aliphatic or cycloaliphatic group, Y_1 is H or a monovalent aliphatic or cycloaliphatic group, the total number of carbon atoms in X_1 and Y_1 in each of B_1 and/or B_2 being 8 to 26; and the other of B_1 and B_2 is either (a) the same or a different group of the formula:

$$-(CO)_p-X_1-C\equiv C-C\equiv C-Y_1$$

where X_1, Y_1 or p are as defined above;

or (b) is an aliphatic or cycloaliphatic group containing at least 8 carbon atoms; n is 0 to 1, m is 2, 3 or 4 and each R independently represents an alkyl group containing 1 to 4 carbon atoms.

4,348,330

PROCESS FOR THE PRODUCTION OF SULPHINATES OF BENZHYDROL COMPOUNDS

Malcolm C. Clark, Cheadle, and John B. Henshall, Manchester, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

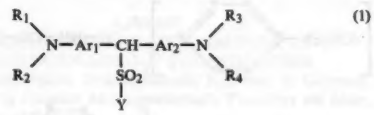
Filed Feb. 6, 1981, Ser. No. 232,084

Claims priority, application United Kingdom, Mar. 14, 1980, 8008768; Oct. 10, 1980, 8032772

Int. Cl.³ C07C 145/00

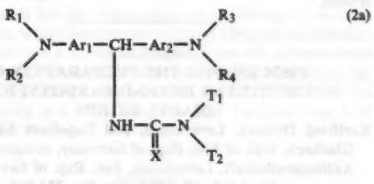
U.S. Cl. 260—456 NS **13 Claims**

1. A process for the production of a sulphinate of formula



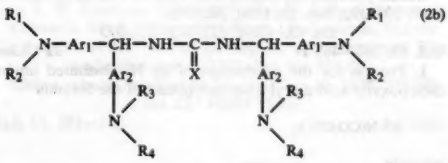
(1)

which comprises reacting, in an organic solvent in the presence of a mineral acid or an organic acid, a compound of the formula



(2a)

or



(2b)

or a mixture of the compounds of formulae (2a) and (2b) with a compound of formula

$$Y-SO_2-M, \quad (3)$$

wherein

Ar_1 and Ar_2 are the same or different and each represents an unsubstituted or substituted aromatic carbocyclic radical, R_1, R_2, R_3 and R_4 independently of one another represent hydrogen, C_1-C_{12}-alkyl, C_2-C_8-alkoxyalkyl, cycloalkyl, aralkyl, aryl, or substituted alkyl, cycloalkyl, aralkyl or aryl, or each of the pairs of substituents (R_1 and R_2) and (R_3 and R_4), together with the nitrogen atom to which said pair is attached, independently, represents a heterocyclic ring, or one or several of the substituents R_1, R_2, R_3

and R_4 with the nitrogen and an adjacent carbon atom of the residue Ar_1 or Ar_2 form a heterocyclic ring,

Y represents an unsubstituted or substituted C_1–C_{20}-alkyl, cycloalkyl, aryl, aralkyl or heterocyclic radical,

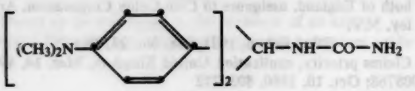
X represents oxygen, sulphur or imino,

T_1 and T_2 independently represent hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, aryl, aralkyl, and T_1 also amido or ureido, or T_1 and T_2 together with the nitrogen atom which links them represent a five or six-membered heterocyclic radical and

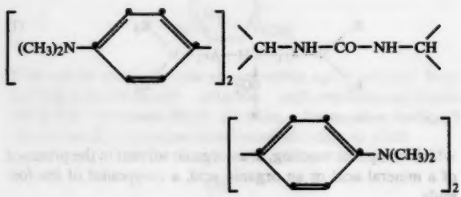
M represent hydrogen, ammonium, an alkali metal or an alkali earth metal.

8. A process according to claim **1**, wherein a mixture of the compounds of formulae (2a) and (2b) is used.

9. A process according to claim **8**, wherein a mixture of the compound of formula



and of the compound of formula



is used.

4,348,331
PROCESS FOR THE PREPARATION OF N-SUBSTITUTED IMIDO-DICARBOXYLIC ACID DIARYL ESTERS

Karlfried Dickore, Leverkusen, and Engelbert Kühle, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,249

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035392; Sep. 19, 1980, 3035393

Int. Cl.[3] **C07C** *125/073, 125/075*

U.S. Cl. 260—465 D **32 Claims**

1. Process for the production of an N-substituted imido-dicarboxylic acid diaryl ester compound of the formula

$$R^1\text{-}N(CO\text{-}OR^2)_2 \qquad (I)$$

wherein

R^1 is a straight-chain or branched alkyl of from 1 to 10 carbon atoms; substituted alkyl wherein the substituents are at least one of lower alkoxy, lower alkylmercapto, halogen, cyano or nitro; alkenyl or alkynyl of from 3 to 8 carbon atoms; cycloaliphatic of from 3 to 8 carbon atoms; substituted by cycloaliphatic wherein the substituent is lower alkyl; araliphatic with from 7 to 12 carbon atoms; substituted araliphatic wherein the aromatic ring system is substituted by halogen, nitro, trifluoromethyl, cyano, lower alkyl or lower alkoxy; an aromatic radical of from 6 to 12 carbon atoms and is optionally substituted by halogen, nitro, trifluoromethyl, cyano, lower alkyl or lower alkoxy;

R^2 is a phenyl or naphthyl radical; substituted phenyl or naphthyl wherein the substituents are at least one of chlorine, methyl or methoxy; and

which process comprises reacting an amine salt of the formula

$$R^1\text{-}NH_2HX^1 \qquad (I)$$

in which

R^1 is defined as above; and

X^1 is a chlorine atom

with a carbonic acid aryl ester halide of the formula

$$R^2O\text{—}CO\text{—}X^2 \qquad (III)$$

wherein

R^2 is defined as above; and

X^2 is a chlorine or fluorine atom

at a temperature from 100° C. to 300° C.

4,348,332
PHOSPHONOFORMALDEHYDE, A PROCESS FOR ITS PREPARATION AND ITS USE AS AN INTERMEDIATE PRODUCT FOR THE PREPARATION OF MEDICAMENTS

Hermann Oediger, Cologne; Folker Lieb, Leverkusen, and Hans Disselnkötter, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

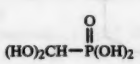
Filed Oct. 5, 1981, Ser. No. 308,717

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039998

Int. Cl.[3] **C07F** *9/38;* **C07D** *213/18*

U.S. Cl. 260—502.4 R **1 Claim**

1. A compound which is phosphonoformaldehyde of the formula



(I)

or a salt thereof.

4,348,333
β-KETOCARBOXYL AND PHOSPHONATE DIHYDRO-CHALCONE SWEETENERS

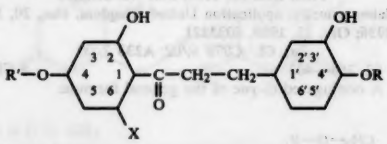
Grant E. DuBois, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Oct. 9, 1981, Ser. No. 310,406

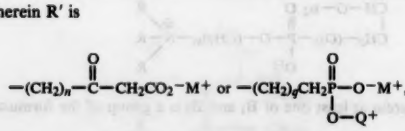
Int. Cl.[3] **C07F** *9/38;* **C07C** *57/38;* **A23L** *1/236*

U.S. Cl. 260—502.4 R **14 Claims**

1. A dihydrochalcone compound represented by the structural formula



wherein R′ is



n and q, respectively, are numbers between 1 and 5, R is a lower alkyl of from 1 to 3 carbon atoms, X is hydrogen or hydroxy, and M^+ and Q^+ are the same or different and are physiologically acceptable cations.

4,348,334

PROCESS FOR PRODUCING THE MAGNESIUM SALT OF 3-NITRO-NAPHTHALENE-1,5-DISULFONIC ACID (NITRO-ARMSTRONG'S ACID)

Bernhard Albrecht, Buus; Hans Frey, Bettingen; Vinzenz Habermacher, Basel, all of Switzerland; Horst Behre, Odenthal, Fed. Rep. of Germany; Lutz Kienitz, Bergisch Gladbach, Fed. Rep. of Germany; Wolfgang Schenk, Leverkusen, Fed. Rep. of Germany; Guido Steffan, and Axel Vogel, both of Odenthal, Fed. Rep. of Germany, assignors to Ciba-Geigy AG, Basel, Switzerland and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1980, Ser. No. 113,412

Claims priority, application Switzerland, Feb. 2, 1979, 1045/79

Int. Cl.³ C07C *143/55*

U.S. Cl. 260—505 C **16 Claims**

1. A process for producing the magnesium salt of 3-nitronaphthalene-1,5-disulfonic acid by sulfonating naphthalene, nitrating the sulfonation product, and separating the pure magnesium salt of 3-nitronaphthalene-1,5-disulfonic acid, which process comprises the steps of:

(a) sulfonating naphthalene wth liquid SO_3 in the presence of an inert organic solvent at temperatures between −40° and +20° C., the ratio of added SO_3 to added naphthalene being during the whole course of addition in the range of 2.5 to 5.0 mols of SO_3 per mol of naphthalene;

(b) adding to the reaction mixture obtained a mixture consisting of about equal parts of 100% sulfuric acid and fully reacted crude nitration mixture obtained at the end of step (b), separating from the resulting two-phase system the upper organic solvent phase by decanting, and removing from the Armstrong's acid anhydride slurry the remainder of organic solvent by distillation, subsequently adding to the residue the amount of nitric acid required for nitration, in admixture with sulfuric acid and SO_3, at a temperature of between 10° and 60° C., and nitrating at this temperature for 1 to 6 hours;

(c) adding then firstly water and afterwards, in the absence of the inert organic solvent, at 90° to 120° C., a compound releasing magnesium ions, the amount being such that per mol of 3-nitronaphthalene-1,5-disulfonic acid, 1.1 to 1.3 mols of magnesium ions are added, and a sulfuric acid concentration of between 40 and 60 percent by weight (relative to the sulfuric acid and water) is maintained; and

(d) separating the crystallised magnesium salt of 3-nitronaphthalene-1,5-disulfonic acid at a temperature of between 20° and 70° C., and subsequently optionally washing it with a maximum of 60 percent by weight of sulfuric acid and/or water.

4,348,335

PROCESS FOR THE PARTIAL REDUCTION OF POLYNITRATED DIARYL COMPOUNDS

Karl Linhart; Dieter Pawellek, both of Leverkusen, and Harald Gleinig, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 139,952

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916815

Int. Cl.³ C07C *143/29*

U.S. Cl. 260—508 **7 Claims**

1. Process for the preparation of 4-nitro-4-aminostilbene-2,2'-disulphonic acid or alkali metal salts thereof by reducing 4,4'-dinitro-stilbene-2,2'-disulphonic acid or alkali metal salts thereof with sulphides, or substances which donate sulphide ions, at elevated temperature, characterised in that the reduction is carried out with equivalent amounts of sulphide per mol of nitro group to be reduced and in the presence of 0.5–10 mols of ammonia per mol of starting compound.

4,348,336

PROCESS FOR THE ISOLATION OF 1-NAPHTHYLAMINE-4,6- AND 1-NAPHTHYLAMINE-4,7-DISULPHONIC ACID

Heinz U. Blank, Odenthal; Horst Behre, Odenthal-Eikamp, and Hans W. Linden, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,414

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013276

Int. Cl.³ C07C *143/60*

U.S. Cl. 260—508 **4 Claims**

1. A process for the isolation of 1-napthylamine-4,6- or 1-napthylamine-4,7-disulphonic acid from sulphonation mixtures obtained in the sulphonation of 1-napthylamine-6- or 1-naphthylamine-7-sulphonic acid, respectively with sulphuric acid and sulphur trioxide, wherein the aqueous solutions or suspensions formed when the sulphonation mixtures are introduced into water are warmed to 85° to 120° C. and the resulting solutions or suspensions are optionally kept for a period of time at this temperature, are then cooled to a temperature below 70° C., and the 1-naphthylamine-4,6- or 1-naphthylamine-4,7-disulphonic acid which has crystallised out is filtered off.

4,348,337

PROCESS FOR THE MANUFACTURE OF 1-HALOGEN-1-OXO-Δ^3-PHOSPHOLENES

Utz-Hellmuth Felcht, Bruchmühlbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 14, 1980, Ser. No. 149,741

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919754

Int. Cl.³ C07F *9/34*

U.S. Cl. 260—543 P **8 Claims**

1. A process for the manufacture of a 1-halogen-1-oxo-Δ^3-phospholene, which comprises reacting a phosphorus trihalide, a 1,2-epoxide and a 1,3-diene, at a temperature of from about 50° to 200° C. and without isolation of an intermediate, the amounts of the phosphorus trihalide, the 1,2-epoxide and the 1,3-diene being in a molar proportion of 1:greater than 1: at least 1, respectively.

4,348,338

INJECTION-TYPE PRESSURE-FREED CARBURETOR

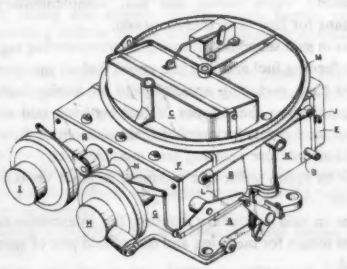
Jose L. P. Martinez, and Jose P. Osorio, both of Viveros de Coyoacan No. 5, Viveros de la Loma, Tlalnepantla, Mexico

Continuation of Ser. No. 71,722, Aug. 31, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,060

Claims priority, application Mexico, Oct. 18, 1978, 175349

Int. Cl.³ F02M *15/04*

U.S. Cl. 261—142 **9 Claims**



1. A pressure-feed, fuel injection type carburetor comprising:

a carburetor base adapted to be connected to an intake manifold of an internal combustion engine, said base having a pair of cylindrical openings therethrough having axial centerlines, a shaft pivotally mounted in said base radially extending across both openings perpendicular to both axial centerlines, a pair of acceleration dampers fixedly mounted on said shaft in said openings and movable with said shaft, vacuum duct means in said base terminating in one of said openings downstream of said dampers, and an idle-speed fuel-air mixture duct terminating in both said openings;

a main housing connected to said base, said main housing including a pair of venturi-shaped internal bores axially aligned on the centerlines of said openings in said base;

a gasifier housing connected to one side of said main housing, said gasifier housing including a heated fluid inlet, a heated fluid outlet, a fuel inlet, a fuel outlet, means interconnecting said fuel inlet to said fuel outlet for transferring heat from a heated fluid to a fuel passing therethrough for gasifying a portion of the fuel;

a secondary housing connected to a side of said main housing opposite said gasifier housing;

pressure-actuated shut-off means mounted on said secondary housing, including a first valve seat in said secondary housing, a first needle adapted to seat on said first seat, first vacuum-operated diaphragm means mechanically connected to said first needle and operative to move said first needle towards and away from said first valve seat, conduit means interconnecting said fuel outlet of said gasifier housing and said first seat, and conduit means interconnecting said vacuum duct means in said base and said first diaphragm means, said shut-off means permitting fuel flow whenever a vacuum is present in one of said openings downstream of said dampers;

primary injection metering valve means mounted on said secondary housing and mechanically linked with one end of said pivotable shaft in said base, said primary valve means including first means for metering fuel in response to the rotational position of said shaft, and means for feeding fuel during low speed operation of the engine, said means for feeding being adapted to be progressively throttled back as said means for metering progressively opens;

complementary injection metering valve means mounted on said secondary housing and mechanically linked with the other end of said pivotable shaft in said base, said complementary valve means including second means for metering fuel in response to the rotational position of said shaft;

means for interconnecting said shut-off means with said primary valve means and said complementary valve means for fuel flow therebetween;

means in said secondary housing interconnecting said means for feeding fuel and said idle-speed fuel-air mixture duct in said base, including an idle-speed air intake duct, means for adjusting the amount of fuel entering said air intake duct, and means for regulating the amount of the resultant fuel-air mixture entering said mixture duct;

a pair of spray units, one mounted in each venturi-shaped bore;

means in said secondary housing for interconnecting said first means for metering and one of said pair of spray units; and

means in said secondary housing for interconnecting said second means for metering to the other of said pair of spray units.

4,348,339

METHOD FOR MANUFACTURING OXIDIC NUCLEAR FUEL BODIES

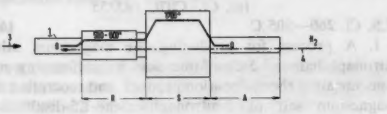
Helmut Assmann, Dormitz; Egbert Brandau, Bebra; Wolfgang Dörr, Erlangen; Viktor Mathieu, Neuberg, and Gerhard Dichtjar, Langenselbold, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft and Reaktor-Brennelement Union GmbH, both of Mülheim, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,973

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855166

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 **10 Claims**



1. Method for manufacturing oxidic nuclear fuel bodies with oxygen-to-metal ratio of 2.0±0.02 at treating temperatures between 1000° and 1400° C., which comprises adding up to 25% U_3O_8 as a grain-growth-promoting sintering additive to a powder selected from the group consisting of UO_2 powder, a powder mixture of UO_2 with gadolinium oxide, and a powder mixture of UO_2 with PuO_2, mixing the additive and said powder and pressing the additive containing mixture into blanks, exposing said blanks in a furnace for a sintering time of up to 30 minutes to a first atmosphere of a mild oxidizing gas to cause the UO_2 powder to come to a constant stoichiometric excess of O_2 to U and sintering said blanks therein at a temperature within the range of 1000°–1400° C., and subsequently exposing the sintered blanks in said furnace to a second atmosphere of hydrogen as a reducing gas at a temperature within the range of 1000°–1400° C.

4,348,340

PRODUCTION OF SPHEROIDAL GRANULES FROM MOLTEN INORGANIC MATERIALS

Francis Gagneraud, Villa Montmorency, 6 Allee des Tilleuls, 75016 Paris, France

Filed Aug. 6, 1980, Ser. No. 175,892

Claims priority, application France, May 20, 1980, 80 11199

Int. Cl.³ B01J *2/02*

U.S. Cl. 264—8 **3 Claims**

1. A process for producing spheroidal granules with a high sphericity index from molten material consisting essentially of metallurgical slag or scoria, comprising:

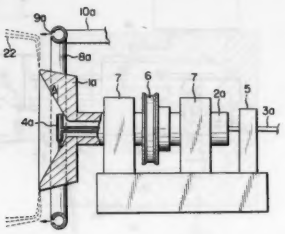
(a) pouring the molten material directly onto an uncooled polygonal rotating device having edge or onto an uncooled cylindrical rotating device equipped with paddles or blades, the peripheral speed of said edges or said paddles or blades being at least 10 meters/second with a sufficient number of said edges or said paddles or blades being present to provide at least 40 passages of said edges or said paddles or blades past a fixed point per second, such that the molten material being poured onto said rotating device is disintegrated into small molten droplets and projected into the ambient atmosphere, said droplets solidifying in the ambient atmosphere into spheroidal granules consisting substantially of granules having a diameter between 0.1 and 5 mm and a hardness index at least equal to 6 (Mohs scale), no gaseous or liquid cooling means, other than the ambient atmosphere, being provided to the molten material during said step (a); and

(b) recovering the formed spheroidal granules.

4,348,341
PROCESS FOR PRODUCTION OF PRECURSOR OF ALUMINA FIBER

Takeshi Furuya; Yoshihisa Uchiyama, and Akinori Kouda, all of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 70,528, Aug. 28, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 167,745
Claims priority, application Japan, Aug. 28, 1978, 53-103850
Int. Cl.³ B01J *2/04*
U.S. Cl. 264—8 **7 Claims**

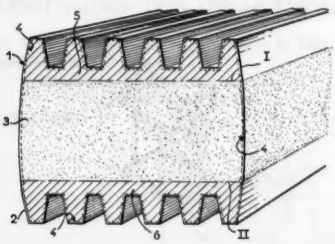


1. A process for the production of a precursor of a polycrystalline alumina fiber comprising
(a) continuously feeding an aqueous solution containing (i) 20 to 35% by weight, calculated as Al_2O_3, of basic aluminum chloride, (ii) up to 10% by weight of colloidal silica, and (iii) 0.2 to 5% by weight of polyvinyl alcohol and having a viscosity of 500 to 2,000 centipoise through the center of a rotating funnel-shaped disk to the inclined surface of said disk;
(b) atomizing said aqueous solution by the centrifugal force of said rotating disk to form droplets;
(c) contacting the droplets of step (b) with a high-pressure fluid to dry and convert said droplets into filaments; and
(d) collecting the filaments in the form of a mat.

4,348,342
METHOD FOR MAKING ELECTRODYNAMIC LOUDSPEAKERS HAVING A PLANAR DIAPHRAGM OF EXPANDED POLYSTYRENE

Ernest Spiteri, 29 Ave. Monge, 77490 Chelles, France

Filed Feb. 12, 1981, Ser. No. 234,020
Claims priority, application France, Mar. 7, 1980, 80 05143
Int. Cl.³ B29C *17/12;* B29D *27/00*
U.S. Cl. 264—28 **5 Claims**



1. A process for producing a diaphragm of expanded polystyrene for an electrodynamic speaker, comprising moulding a blank of expanded polystyrene with the use of steam in a mould to produce the blank in its definitive state with a ribbed and grooved surface on the blank, removing the blank from the mould, making use of a residual amount of said steam which remains just after the expansion of the polystyrene and is trapped to a certain percentage in the blank by lowering the temperature of the blank and condensing said steam and causing the water of said steam to travel toward said ribbed and grooved surface of the blank, brutally freezing the blank so as to produce microfractures in a thin superficial zone of the blank, and removing said superficial zone by a suitable machining operation so as to expose under said superficial zone a softer aspect of the diaphragm immediately subjacent to said superficial zone.

4,348,343
METHOD AND COMPOSITION FOR A FURAN-MODIFIED PHENOLIC NOVOLAK BINDER SYSTEM

Denis W. Akerberg, Huntley; George W. Huffman, Crystal Lake, and Carl A. Rude, Cary, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

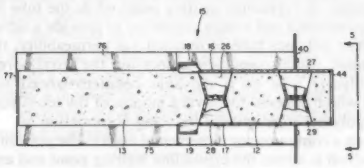
Filed Oct. 6, 1980, Ser. No. 194,118
Int. Cl.³ C01B *31/00*
U.S. Cl. 264—29.5 **20 Claims**

1. A method for forming shapes comprising the steps of
a. mixing particles of a solid particulate material and a liquid amine capable of reacting with furfural into a substantially uniform blend;
b. mixing at room temperature said blend from step (a) with a resin system comprising a phenolic novolak resin dissolved in furfural;
c. continuing mixing until a free-flowing dry particulate solid results, and
d. forming said particulate solid into a desired shape whereby shapes of refractory material with satisfactory green strength are formed, said shapes being capable of being baked and carbonized.

4,348,344
METHOD AND DEVICE FOR PRODUCING SLOTTED CONCRETE WALLS IN PLACE

Paul J. Nobbe, R.R. 2, Brookville, Ind. 47012

Filed Sep. 22, 1980, Ser. No. 189,090
Int. Cl.³ E04B *1/16;* B22C *9/22*
U.S. Cl. 264—31 **10 Claims**



1. A method of producing a slotted vertical wall on site in a building for livestock comprising the steps of:
positioning on the final use site for said wall a pair of mutually facing and aligned plastic molds having vertically extending hollow ridges with horizontally extending top lips;
locating said ridges of one of said molds against and aligned with ridges of the other of said molds to insure absence of concrete directly between ridges of one mold and ridges of the other mold forming slotted openings in the concrete wall to be formed;
locating a first pair of forms on opposite sides of said molds;
hanging said molds on said forms by positioning said top lips atop said forms;
extending a plurality of ties through said ridges of said molds;
attaching said ties to said forms, securing said forms and molds together;
pouring concrete between said molds forming a slotted concrete wall;

removing said forms and molds once said concrete has solidified; and

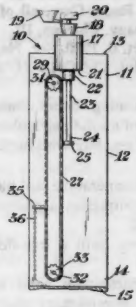
leaving said concrete as solidified permanently in the vertical position poured and formed.

4,348,345

METHOD FOR THE TAKE-AWAY OF VERTICALLY EXTRUDED SYNTHETIC RESINOUS TUBES

Edward L. Burnett, and Eugene V. Stack, both of Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1981, Ser. No. 227,842
Int. Cl.³ B27J 5/00
U.S. Cl. 264—127 **4 Claims**



1. In a method for the fabrication of a tetrafluoroethylene polymer tube wherein tetrafluoroethylene polymer resins are downwardly ram extruded in a ram extruder to heat and generally fuse together the polytetrafluoroethylene particles to provide a coherent tetrafluoroethylene polymer tube from the ram extruder, subsequently cooling the tetrafluoroethylene polymer tube to a self supporting condition, the tetrafluoroethylene polymer tube being discharged from the extruder at a temperature above its crystalline melting point, cooling the tube below its crystalline melting point while the tube is radially unsupported and axially supported to provide a tetrafluoroethylene polymer tube of reduced gas permeability, the improvement which comprises supporting the tetrafluoroethylene polymer tube on a movable counterbalanced support means which permits downward motion of the tetrafluoroethylene polymer tube without inducing deformation of the tube either on a continuous or incremental basis to the portion of the tube which is above the crystalline melting point and external to the ram extruder.

4,348,346

POLYESTER FILM EXTRUSION WITH EDGE BEAD CONTROL

Kenneth P. Thompson, Canton, N.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 23, 1980, Ser. No. 171,391
The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.
Int. Cl.³ B29D 7/02
U.S. Cl. 264—146 **6 Claims**

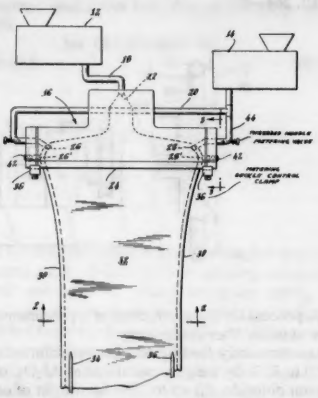
1. A process for forming a film of a thermoplastic film-forming, polyester comprising the steps of:

(a) heating and plasticizing the polyester;

(b) feeding the heated and plasticized polyester to a die having an elongated die opening and a deckled area therein. thereby producing a flowing stream of the polyester;

(c) heating and plasticizing a second organic polymer;

(d) feeding the heated and plasticized second organic polymer into the die and directing it into the flowing stream of the polyester adjacent to but spaced inwardly of the steam's outer edges and sufficiently upstream of the elongated die opening to eliminate the existence of any dead spaces adjacent said deckled area where said polyester or second polymer could accumulate and to permit overlapping of the polyester and the second polymer in the areas near both opposite edges of the elongated die, thereby forming a composite stream of the polyester and second polymer;



(e) extruding the composite stream from the elongated die opening to form a film comprising a central portion of the polyester and two edge portions of the polyester and the second polymer, the central portion of the polyester covering at least a major part of the width of the film; and

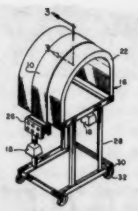
(f) drawing the film from the die opening at a rate greater than the rate of extrusion to thereby reduce the thickness of the film.

4,348,347

STRETCH-STAGING OF RESIN-BASED FIBER-IMPREGNATED TAPE

Gary G. Brown, Escondido, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,120
Int. Cl.³ B29C 25/00
U.S. Cl. 264—231 **4 Claims**



1. A method for strengthening a length of resinous tape impregnated with continuous fiber columns, comprising the steps of:

supporting the tape in a continuous curve along the entire length of the tape;

stretching the tape at the ends thereof in the direction of fiber columns; and

staging the tape, while being supported and stretched, so

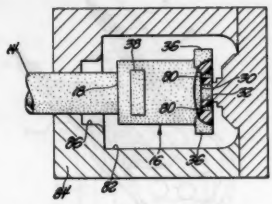
that the fiber columns are straightened and retained in a straightened condition thereafter.

4,348,348

METHOD FOR MAKING A REMOTE CONTROL ASSEMBLY WITH VIBRATION DAMPENER

William G. Bennett, Troy, and Arthur L. Spease, Livonia, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.

Filed Jun. 23, 1980, Ser. No. 162,172
Int. Cl.³ B29D *3/00, 31/00*
U.S. Cl. 264—255 **11 Claims**



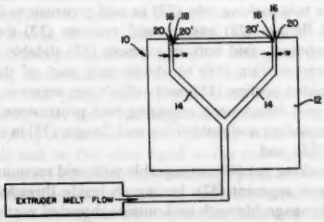
1. A method for making a motion transmitting remote control assembly (10) of the type for supporting a flexible motion transmitting core element (12) including the steps of: inserting the end portion of a conduit (14) into a cavity (72) of a first mold (74) and injecting a hardenable organic polymer into the cavity for molding an end fitting (16) about the conduit (14); inserting the end fitting (16) into a cavity (82) of a second mold (84) and injecting a hardenable vibration dampening material into the cavity of the second mold to mold the vibration dampening material about the end fitting (16) and the end portion of the conduit (14) to define a vibration dampener (24) including an extending section (26); placing the conduit (14) with the vibration dampener (24) in a third mold (90) having a third cavity (88), the extending section (26) engaging the third mold (90) and the remaining portion of the vibration dampener (24) being spaced from the third mold (90) defining the third cavity (88); injecting a hardenable organic polymer into the third cavity (88) about the vibration dampener (24) to form a support member (22) spaced from and isolated from said end fitting (16) by the vibration dampener; and allowing the materials of the end fitting (16), vibration dampener (24) and support member (22) to harden so that the vibration dampener (24) is softer than the end fitting (16) or the support member (22).

4,348,349

METHOD FOR REDUCING MELT FRACTURE DURING EXTRUSION OF A MOLTEN NARROW MOLECULAR WEIGHT DISTRIBUTION, LINEAR, ETHYLENE COPOLYMER

Stuart J. Kurtz, Martinsville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 1, 1980, Ser. No. 192,701
Int. Cl.³ B29D *23/04*
U.S. Cl. 264—564 **15 Claims**



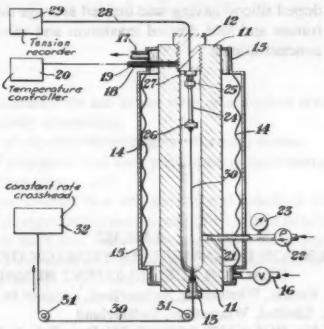
1. A process for reducing melt fracture formed during extrusion of a molten narrow molecular weight distribution, linear, ethylene polymer, under conditions of flow rate and melt temperature which would otherwise produce higher levels of melt fracture which comprises extruding said polymer through a die having a discharge outlet defining an exit die gap formed by opposing die lip surfaces and wherein one surface of the die lip and/or die land in contact with the molten polymer extends beyond the opposing surface of the die lip and/or die land in the direction of the axis of flow of the molten polymer through the die exit whereby melt fracture is reduced on the surface of the polymer leaving the extended die lip surface.

4,348,350

ULTRA-DRAWING CRYSTALLINE POLYMERS UNDER HIGH PRESSURE

Dale J. Meier, Midland, Mich., and Leszek Jarecki, Warsaw, Poland, assignors to Michigan Molecular Institute, Midland, Mich.

Filed Sep. 26, 1980, Ser. No. 191,322
Int. Cl.³ B29C *23/00*
U.S. Cl. 264—570 **10 Claims**



1. A process of making transparent high-modulus polymer filament, rod, or film which comprises ultra-drawing a crystalline organic polymer in the solid state at a temperature within 70° C. of but below its melting point at the operating pressure while subjecting the polymer during and immediately after drawing to a hydrostatic pressure of at least about 500 atmospheres by a medium inert to the polymer, thereby to restrain void formation in the polymer during ultradrawing and render the product transparent.

4,348,351

METHOD FOR PRODUCING NEUTRON DOPED SILICON HAVING CONTROLLED DOPANT VARIATION

Horst G. Kramer, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 21, 1980, Ser. No. 142,310
Int. Cl.³ G21G *1/06*
U.S. Cl. 376—183 **6 Claims**

1. A method for producing neutron doped silicon having controlled dopant variation, comprising

selection of undoped single crystal silicon bodies according to the following, measuring the criteria fluctuation in said undoped silicon base level dopant concentration as expressed by the difference between maximum and minimum dopant concentrations, determining the average base level dopant concentration of said undoped single crystal silicon bodies, determining the desired average dopant concentration in the neutron doped silicon, determining the desired maximum and minimum dopant concentrations in the neutron doped silicon, selecting those undoped single crystal silicon bodies whose measured fluctuation is

no more than said average dopant concentration in the neutron doped silicon multiplied by a homogeneity factor of the neutron doped silicon as measured by the difference between said maximum and said minimum dopant concentrations divided by said average dopant concentration in the neutrol doped silicon

and whose maximum dopant concentration in the undoped state is greater than one tenth of said desired maximum dopant concentration in the neutron doped silicon and whose base level dopant concentration in the undoped state is less than said neutron doped silicon desired average dopant concentration by a factor which is a ratio of (a) desired homogeneity in the neutron doped silicon as expressed by the difference between said maximum and said minimum dopant concentrations of the neutron doped silicon divided by said doped silicon average dopant concentration to (b) homogeneity of the undoped single crystal silicon, as measured by said difference between maximum and minimum dopant concentrations of the undoped silicon divided by said average dopant concentration subjecting said selected undoped single crystal silicon body to sufficient neutron radiation so as to obtain neutron doped silicon having said desired average dopant concentration and said desired maximum and minimum dopant concentrations.

4,348,352

RACK FOR INTERMEDIATE STORAGE OF NUCLEAR REACTOR FUEL ELEMENT BUNDLES

Max Knecht, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

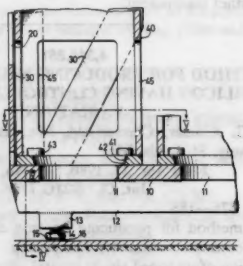
PCT No. PCT/CH79/00072, § 371 Date Feb. 1, 1980, § 102(e) Date Feb. 1, 1980, PCT Pub. No. WO80/00046, PCT Pub. Date Jan. 10, 1980

PCT Filed May 22, 1979, Ser. No. 192,506

Claims priority, application Switzerland, Jun. 9, 1978, 6310/78

Int. Cl.³ G21C *19/00*

U.S. Cl. 376—272 **10 Claims**



1. A storage rack for fuel element bundles, said rack comprising,

a bottom plate;

a plurality of vertically disposed square receiving tubes, each tube having an inwardly directed flange resting on said plate and defining a bore for centering a fuel element bundle; and

screws passing through each flange and into said plate to secure said tubes to said plate.

4,348,353

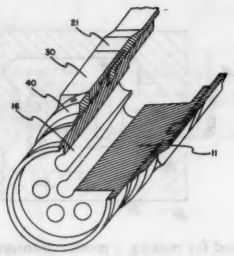
NUCLEAR REACTOR FUEL ASSEMBLY DUCT-TUBE-TO-INLET-NOZZLE ATTACHMENT SYSTEM

David W. Christiansen, and Bob G. Smith, both of Kennewick, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 12, 1980, Ser. No. 206,231

Int. Cl.³ G21C *15/00*

U.S. Cl. 376—364 **9 Claims**



1. A nuclear reactor fuel assembly duct-tube-to-inlet-nozzle attachment system, comprising:

(a) a nuclear reactor fuel assembly inlet nozzle having an upper end (11) with a generally equilateral polygonal top section (12) and a generally cylindrical bottom section (14), said top section (12) and said bottom section (14) being coaxially interconnected, said top section (12) with each of its sides having an external recess (13) and said bottom section (14) having an outside threaded portion (15);

(b) a nuclear reactor fuel assembly duct tube having a generally equilateral polygonal lower end (21), the lower end's (21) polygon shape being similar to the inlet nozzle upper end top section's (12) polygon shape, said lower end (21) with each of its sides having an outwardly-extending protrusion (24), after which each side terminates in a deflectable locking tab (22), said locking tabs (22) slidable over said top section (12) to said recesses (13), each of said locking tabs (22) ending in an inwardly-extending, recess-matching flange (23), said flanges (23) coaxially surrounding and engaging said recesses (13) for attachment of said duct tube's lower end (21) to said inlet nozzle's upper end (11);

(c) a retaining collar (30) having a flange-restraining, protrusion-engaging, generally equilateral polygonal top segment (31) and a generally cylindrical bottom segment (32), said top segment (31) and said bottom segment (32) being coaxially interconnected, the top segment's (31) polygon shape being similar to the inlet nozzle upper end top section's (12) polygon shape, said top segment (31) slidable over said locking tabs (22) to said protrusions (24) when said flanges (23) engage said recesses (13) during said attachment, said bottom segment (32) slidable over said bottom section (14) to above only part of the outside threaded portion (15), said collar's top segment (31), during said attachment, engaging said protrusions (24), and surrounding and restraining said flanges (23) in said recesses (13); and

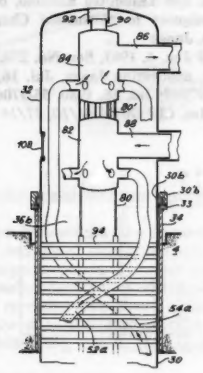
(d) a locking nut (40), engageable with said retaining collar's bottom segment (32), having an inside threaded portion (41) engageable with said outside threaded portion (15) to secure said retaining collar's top segment (31) against said duct tube lower end's protrusions (24) during said attachment.

4,348,354

SEMI-MODULAR HEAT EXCHANGER FOR NUCLEAR REACTORS

Robert Artaud, Aix-en Provence; Michel Aubert, Manosque; Richard Elbeze, Aix-en Provence, and Patrick Jogand, La Tour d'Aigues, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed May 30, 1980, Ser. No. 154,604
Claims priority, application France, May 31, 1979, 7914000
Int. Cl.[3] G21C *15/00*; G21D *5/08*
U.S. Cl. 376—405 7 Claims



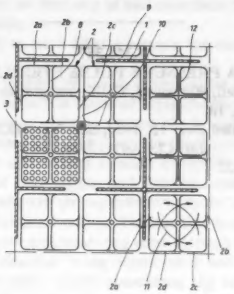
1. In a nuclear reactor having a vessel sealed by a horizontally disposed slab, a heat exchanger comprising an outer ferrule disposed along and defining a vertical axis, said ferrule being provided at its upper end with a supporting flange which bears on said slab by means of a supporting sleeve, said ferrule being extended by an upper dome connected to the ferrule, a supply manifold and a discharge manifold for a secondary fluid, the manifolds being positioned within the upper dome, a plurality of heat exchange modules located within said ferrule, each said modules having substantially vertically disposed straight tubes opening in a secondary fluid inlet chamber and in a secondary fluid outlet chamber and orifices for introducing and removing a primary fluid with respect to each module, a plurality of supply pipes connecting said supply manifold to each inlet chamber, a plurality of discharge pipes connecting each outlet chamber with said discharge manifold, and a plurality of biological protection plates positioned within the outer ferrule level with said slab, wherein said heat exchanger further comprises at least one base plate peripherally fixed to said outer ferrule, each of said modules, said supply manifold and said discharge manifold, and said biological protection plates being connected to said outer ferrule by a single of said at least one base plate, each module being suspended to the corresponding base plate by a supporting ferrule traversing the latter and being connected on the one hand to the upper end of the module and on the other hand to the corresponding base plate, said supply pipes and said discharge pipes traversing said corresponding base plates through thermally expandible sealing means and having between said manifolds and said corresponding base plate portions which absorb thermal expansion of said pipes, whereby thermally induced mechanical stresses are reduced.

4,348,355

FUEL ASSEMBLY FOR A BOILING NUCLEAR REACTOR

Olov Nylund, Västeras, Sweden, assignor to AB Asea-Atom, Västeras, Sweden

Filed Jun. 11, 1980, Ser. No. 158,616
Claims priority, application Sweden, Jul. 3, 1979, 7905800
Int. Cl.[3] G21C *3/32*
U.S. Cl. 376—434 9 Claims



1. A fuel assembly for use in the core of a nuclear reactor, said fuel assembly comprising

a plurality of separate elongated box-forming means,

a bundle of elongated fuel rods positioned in each elongated box-forming means, and

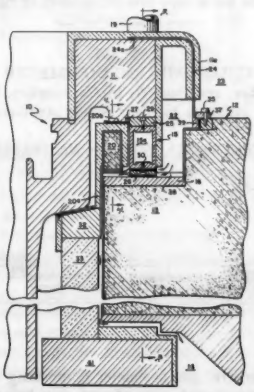
separate spaced-apart first and second end members which mount the respective opposite ends of all of said box-forming means such that they are spaced apart from one another and oriented in parallel, said first and second end members being supportable in said core.

4,348,356

REACTOR VESSEL SUPPORT SYSTEM

Martin P. Golden, Trafford, and John C. Holley, McKeesport, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,323
Int. Cl.[3] G21C *13/00*
U.S. Cl. 376—461 7 Claims



1. In a nuclear reactor vessel support system including a nuclear reactor vessel having an outwardly extending support ring, a nuclear reactor containment structure surrounding the

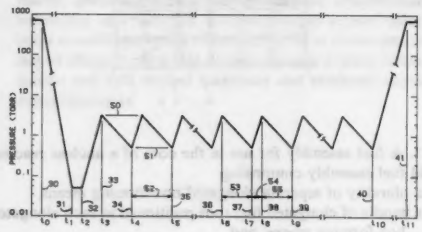
vessel, the containment structure having an inwardly extending support ledge aligned with and attached to the support ring whereby the vessel weight is transmitted to the support ledge, the improvement comprising a box ring interposed in load bearing relationship directly between the support ring and support ledge to transmit the vessel weight from the support ring to the support ledge, said box ring having rigid cylindrical side walls and flat rigid ring-shaped upper and lower walls to enclose and define an annular space directly between the support ledge and the support ring to limit heat flow therebetween.

4,348,357

PLASMA PRESSURE PULSE STERILIZATION

Roger M. Bithell, Richmond, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 12, 1980, Ser. No. 215,597
Int. Cl.³ A61L *2/14, 2/24*
U.S. Cl. 422—22 **9 Claims**



1. A process for sterilizing an article having at least one aperture therein, in a plasma reactor, and without gas flow passing unidirectionally through said aperture comprising the steps of:

supplying a reactant gas appropriate for plasma generation;

varying pressure of said reactant gas within said plasma reactor up and down in a cycle over a prescribed range, each said cycle comprising a pressure-rise interval less than 60 seconds and a pressure-fall interval longer than and following each pressure-rise interval;

energizing a plasma reactor generator during at least the pressure-rise interval to create active species for sterilization; and

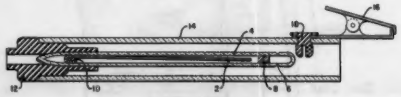
continuing for a sufficient time such that a contaminant on said article has a very low probability of survival.

4,348,358

COLORIMETRIC DOSIMETER

Elmer S. McKee, and Paul W. McConnaughey, both of Pittsburgh, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Sep. 25, 1980, Ser. No. 190,593
Int. Cl.³ G01N *21/78*
U.S. Cl. 422—56 **12 Claims**



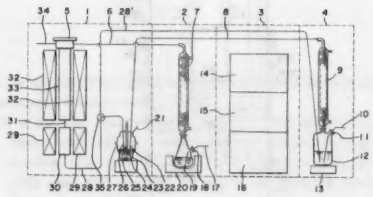
1. A colorimetric gas dosimeter comprising a transparent tube having closed ends, one of said ends being openable, a detecting strip of a substrate carrying a reagent that changes color on contact with the gas to be determined, the strip being disposed lengthwise in the tube with one end of the strip spaced from the openable end of the tube by a diffusion path and with at least one side of said strip spaced apart from said tube along a substantial portion of the length of said strip.

4,348,359

DEVICE FOR DETERMINING VARIOUS TYPES OF TRACE NITROGEN

Tomonori Kojima, and Yasumitsu Katsuno, both of Kita-Kyushu, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,231
Claims priority, application Japan, Jul. 16, 1980, 55-97066; Jul. 16, 1980, 55-97067; Jul. 16, 1980, 55-97068
Int. Cl.³ G01N *31/10, 31/16*
U.S. Cl. 422—76 **12 Claims**



1. A device for determining various types of trace nitrogen, which comprises the following measuring system and distillation system (A):

(a) a measuring system which comprises

(1) a reaction section comprising a cylindrical reaction tube having a sample inlet and a hydrogen gas supplying tube at one end, and a gas outlet at the other end, and packed therein with a catalyst for reduction,

(2) an acidic gas removal section comprising a container having a gas inlet and a gas outlet, and packed therein with a solid alkaline substance,

(3) heating sections for heating the reaction section and the acidic gas removal section, and

(4) a coulometric titration section comprising gas supplying tube means, a gas outlet, electrolytic electrodes, termination point detecting electrodes, and an electrolytic cell,

the reaction section and the acidic gas removal section being accommodated in the respective heating sections, the gas outlet of the reaction section being connected with the gas inlet of the acidic gas removal section, the gas outlet of the acidic gas removal section being connected with the gas supplying tube means of the coulometric titration section, and said gas supplying tube means being open in the vicinity of the bottom in the electrolytic cell, and

(b) a distillation system A which comprises

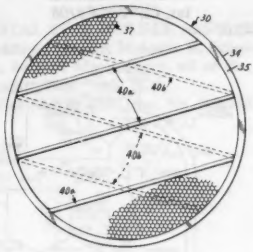
(1) a distillation vessel having a sample inlet, a carrier gas supplying tube and a gas outlet, and made of an alkali resistant material, and

(2) a reflux condenser, said carrier gas supplying tube being open in the vicinity of the bottom in the distillation vessel, the lower end of the reflux condenser being connected with the gas outlet of the distillation vessel and the upper end thereof being connected with the gas supplying tube means of said coulometric titration section.

4,348,360
CATALYTIC CONVERTER FOR OZONE REMOVAL IN AIRCRAFT

Jeffrey C. Chang, Woodbury, and Arthur W. Pluim, Jr., Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 5, 1979, Ser. No. 91,139
Int. Cl.³ A62B *7/08;* B32B *3/04;* B01J *8/02*
U.S. Cl. 422—122 **13 Claims**



1. A cartridge for a catalytic ozone converter, said cartridge comprising:

(a) an aluminum honeycomb core consisting essentially of a plurality of corrugated aluminum sheets bonded together at their contiguous points of contact to define a plurality of longitudinally aligned, thin-walled passages in the form of regularly repeating cells of such dimensions as to ensure turbulent flow of air therethrough, and with the nodes of said cells being the loci of said contiguous points of contact;

(b) a tubular metal shell surrounding the outer wall of said core and affixed thereto;

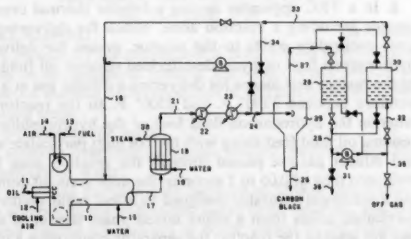
(c) one or more metal rib support members each fastened at its two ends to said shell and fastened along its length to said core so as to transversely intersect a plurality of said nodes; and

(d) a catalytic material deposited on the walls of said cells to form a catalytic surface for reaction with fluid passing through said core.

4,348,361
CARBON BLACK RECOVERY

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 44,147, May 31, 1979, Pat. No. 4,289,742.
This application May 18, 1981, Ser. No. 264,308
Int. Cl.³ C01B *31/02;* C09C *1/48*
U.S. Cl. 422—150 **4 Claims**



1. A carbon black producing and recovery system comprising in combination

(a) a carbon black producing furnace having a hot smoke outlet connected to the inlet of a waste heat boiler;

(b) an indirect heat exchange apparatus connected to the outlet of said waste heat boiler and the inlet of a cyclone separator provided with an outlet in the lower portion for removal of separated carbon black product and an outlet in the upper portion for removal of carbon black smoke reduced in carbon black content;

(c) at least two filter chambers, each containing a bed of aggregate material, at least one of said chambers being on filtration cycle and connected at the inlet end to said outlet in the upper portion of said cyclone for removal of remaining carbon black in said smoke being passed therethrough and at least one of said chambers being on regeneration cycle;

(d) an outlet in each filter chamber for removal of clean off-gas;

(e) a valved conduit connecting said outlet in (d) with the outlet end of said at least one filter chamber having a bed of aggregate containing carbon black solids which is on regeneration cycle and closed to the filtering cycle;

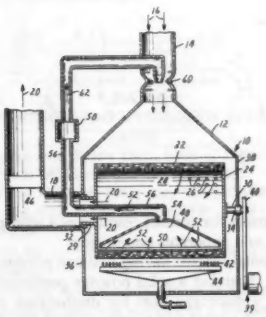
(f) means in said valved conduit of (e) for increasing the pressure of said off-gas and forcing same through said filter chamber(s) on regeneration cycle to substantially remove deposited carbon black solids remaining from a filtering cycle and removing same through the inlet end of said filter chamber being regenerated; and

(g) valved conduit means connecting the inlet end of said filter chamber being regenerated in (f) and said furnace in (a) to quench carbon black smoke within said furnace.

4,348,362
AIR POLLUTION CONTROL APPARATUS AND PROCESS

George D. Foss, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 24, 1980, Ser. No. 190,196
Int. Cl.³ B01D *50/00*
U.S. Cl. 422—171 **28 Claims**



1. Apparatus for removing airborne particulate material and organic vapors from a polluted air stream comprising:

(a) a housing having an inlet plenum for introduction of a polluted air stream thereinto,

(b) a burner located within said housing,

(c) a collector which rotates at a speed in the range of 0.1 to 10 cm/sec located within said housing, said collector comprising an assembly of layers of refractory microfiber mats, metal screens, and vapor adsorbents, one of said refractory microfiber mats being on the exposed surface of said collector adjacent to said burner and being capable of withstanding temperatures of at least 600° C. produced by a burner, the microfibers having diameters in the range of 0.1 to 40 μm and said microfiber mats having a thickness in the range of 2.5 to 25 mm and a bulk density in the range of 4 to 40 mg/cc, and one of said vapor adsorbent layers which is capable of withstanding temperatures up to 450°

C. being on the inner surface of said collector, and by its position said collector being

(1) a filtering and adsorption station for particulate matter and organic vapors when said collector is located across said inlet plenum, and

(2) a combustion and desorption station when said collector is located adjacent said burner and in the presence of heat from said burner for combustion of particulte matter and desorption of organic vapors,

(c) an oxidizing means for converting the desorbed vapor into oxidized pollutant-free products,

(d) connecting means for providing passage for exhaustion of the resultant pollutant-free air stream from the filtering and absorption station to an outlet plenum,

(e) connecting means for providing passage for the resultant combustion products and desorbed vapors from the combustion and desorbing station to said oxidizing means,

(f) connecting means for providing passage for said combustion and oxidized products to the atmosphere or, optionally, back to the inlet plenum, and

(g) means for moving the rotatable collector continuously from the filtering and adsorption station to the combustion and desorption station.

4,348,363

APPARATUS FOR SOLID GAS REACTION

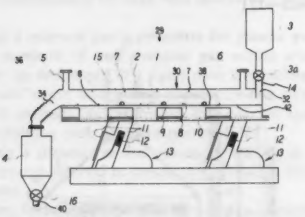
Toru Akiyama; Tsutomu Kamihigoshi, both of Takatsuki; Shoji Takagi, Toyonaka, and Tadayuki Maeda, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 24, 1980, Ser. No. 132,992

Claims priority, application Japan, Mar. 30, 1979, 54-39193; May 31, 1979, 54-74256

Int. Cl.³ B01J *8/08, 8/16, 8/18*

U.S. Cl. 422—192 **6 Claims**



1. An apparatus for contact reaction of a solid powder and a reactive gas, said apparatus comprising:

(a) a horizontal reactor having two end portions with a feed port for receiving a solid powder positioned in one end portion, a discharge port for discharging product positioned in the other end portion, a feed port for receiving reactive gas positioned in one end portion and a discharge port for discharging said gas positioned in the other end portion, said horizontal reactor comprising:

(i) a trough comprising:

(A) a bottom wall,

(B) end walls, and

(C) side walls, each wall having an inner surface and an outer surface, and

(D) a cover having an inner surface and an outer surface;

(ii) a plurality of weirs positioned at intervals on the inner surface of the bottom wall and projecting upward therefrom; and

(iii) a plurality of baffle means positioned at intervals on the inner surface of the cover and projecting downward therefrom; and

b) vibrating means for vibrating the trough.

4,348,364

THERMAL REGENERATIVE CRACKING APPARATUS AND SEPARATION SYSTEM THEREFOR

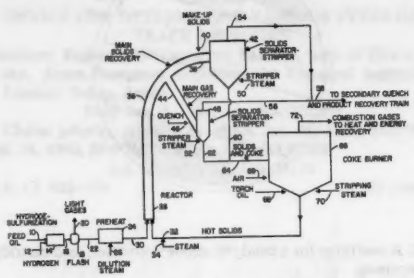
Robert J. Gartside, Auburndale, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Continuation-in-part of Ser. No. 55,148, Jul. 6, 1979, Pat. No. 4,288,235. This application Jul. 3, 1980, Ser. No. 165,781

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ B01J *8/08*

U.S. Cl. 422—214 **12 Claims**



1. In a TRC apparatus having a tubular thermal cracking reactor including a reaction chamber cracking zone, means for delivering hot inert particulate solids to the reactor, means for delivering hydrocarbon feed or hydrodesulfurized residual oil fluid feed to the reactor and means for delivering a diluent gas at a temperature between 1300° F. and 2500° F. to the reactor and wherein the hydrocarbon fluid feed or the hydrodesulfurized residual oil fluid feed along with the inert particulate solids and diluent gas are passed through the cracking zone for a residence time of 0.05 to 2 seconds, the improvement comprising a solids-gas separator designed to effect rapid removal of particulate solids from a dilute mixed phase stream of solids and gas leaving the reactor, said separator comprising a chamber for disengaging solids from the incoming mixed phase stream, said chamber having rectilinear longitudinal walls to form a flow path essentially rectangular in cross section, said chamber also having a mixed phase inlet, a gas phase outlet, and a solids phase outlet, with the inlet being at one end of the chamber disposed normal to one wall of the rectilinear chamber, the solids phase outlet being at the other end of the chamber and suitably arranged for downflow of discharged solids by gravity, and the gas outlet being therebetween and oriented to effect a 180° change in direction of the gas and wherein the separator further comprises a weir disposed in said chamber and extending across the flow path adjacent the gas phase outlet upstream of the solids phase outlet.

2. In a TRC apparatus having a tubular thermal cracking reactor including a reaction zone, means for delivering hot inert particulate solids to the reactor, means for delivering hydrocarbon feed or hydrodesulfurized residual oil fluid feed to the reactor and means for delivering a diluent gas at a temperature between 1300° F. and 2500° F. to the reactor and wherein the hydrocarbon fluid feed or the hydrodesulfurized residual oil fluid feed along with the hot inert particulate solids and diluent gas are passed through the reaction zone for a residence time of 0.05 to 2 seconds, the improvement comprising a solids-gas separator designed to effect rapid removal of particulate solids from a dilute mixed phase stream of solids and gas leaving the reactor, the separator comprising a chamber for disengaging solids from the incoming mixed phase stream, said chamber having slightly arcuate longitudinal walls to form a flow path essentially rectangular in cross section, said chamber also having a mixed phase inlet, a gas phase outlet, and a solids phase outlet, with the mixed phase inlet being at one end of the chamber and disposed normal to one wall of the

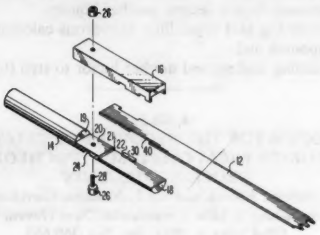
rectilinear chamber, and the solids phase outlet being at the other end of the chamber and suitably arranged for downflow of discharged solids by gravity, and said gas phase outlet being therebetween and oriented to effect a 180° change in direction of the gas, and wherein said separator further comprises a weir disposed in said chamber and extending across said flow path adjacent said gas phase outlet upstream of said solids phase outlet.

4,348,365

CRYSTAL SEED HOLDER ASSEMBLY

Nicholas F. Gubitose, Moosic; Malcolm R. Schuler, and David L. Patterson, both of Mountaintop, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1981, Ser. No. 242,046
Int. Cl.³ C30B *15/32*
U.S. Cl. 422—249 5 Claims



1. A crystal seed holder assembly comprising a rod member having a portion of reduced cross-section adjacent one end, said portion being formed with a first generally planar surface, a clamp member formed with a second generally planar surface, fastener means securing said clamp member to said rod member with said planar surfaces being adjacent each other in spaced apart relationship to form a track, a crystal seed slideably retained in said track, and stop means for limiting movement of the crystal seed in said track, wherein said stop means includes a rib member formed on said first planar surface and a notch formed in said crystal seed for seating around said rib member.

4,348,366

PROCESS FOR THE PRODUCTION OF ALUMINA AND ALUMINA COMPOUNDS FROM WASTES

Raymond J. Brown, 2235 Hackamore Ct., Walnut Creek, Calif. 94596; Ronald L. Keller, 1003 N. Main St., Bicknell, Ind. 47512, and Charles F. Lang, 3528 Hillcrest Rd., Vincennes, Ind. 47591

Filed Apr. 6, 1981, Ser. No. 251,345
Int. Cl.³ C01F *7/02*
U.S. Cl. 423—111 24 Claims

1. A process for the conversion of substantially all aluminum present in an aluminum bearing secondary waste source to anhydrous alumina and compounds of alumina comprising the following steps:

(a) pulverizing the waste;

(b) scalping oversized aluminum bearing particles from the pulverized waste;

(c) subjecting the oversized particles to further pulverizing;

(d) combining the pulverized waste from steps (a), and (c), and placing the mixture in water heated to the range of 120°–180° F., thereby forming a slurry;

(e) agitating the slurry;

(f) continuously pulverizing the particles remaining in the slurry to maximize their reactive surface area;

(g) continuing pulverization and agitation until the carbides, nitrides, and aluminum alloys are dissociated, the resulting aluminum ions are hydrolized and oxidized and all particles are reduced to predominantly sub-micron sizes;

(h) diluting, decanting and filtering the reacted product to obtain an intermediate product;

(i) mechanically processing, drying and dehydrating the intermediate product; and

(j) calcining to a finished product.

4,348,367

SELECTIVE REMOVAL OF COBALT(II) FROM AQUEOUS SOLUTIONS WITH PHOSPHINIC EXTRACTANTS

William A. Rickelton, Niagara Falls; Allan J. Robertson, Thorold, both of Canada, and David R. Burley, Kinnelon, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 182,296, Aug. 28, 1980, abandoned. This application May 14, 1981, Ser. No. 263,528
Int. Cl.³ C01G *51/00*
U.S. Cl. 423—139 44 Claims

19. A process for the extraction of cobalt(II) from an aqueous cobalt(II)-bearing solution containing metal ions and having a pH of 4.0 to 6.0 comprising contacting said solution with an extraction solvent at about 0° to 80° C., thereafter separating the aqueous phase from the cobalt(II)-loaded phase wherein said extraction solvent comprises from about 2 to 99 parts by volume of an organic-soluble phosphinic acid having at least 2 carbon atoms or an organic-soluble salt thereof, from about 98 to 1 parts by volume of a water-immiscible organic diluent and from 0 to about 15 parts by volume of a phase modifier.

30. A process according to claim 19 with the additional steps of contacting the cobalt(II)-loaded extraction solvent with an aqueous solution of a mineral acid at about 0°–80° C. to strip the cobalt(II) into the aqueous phase; separate the cobalt(II)-containing aqueous phase; and, recovering the stripped extraction solvent for subsequent reuse.

4,348,368

METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES

George C. Blytas, and Zaida Diaz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 26, 1981, Ser. No. 267,196
Int. Cl.³ B01D *53/34;* C01B *17/04*
U.S. Cl. 423—226 20 Claims

1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution comprising a reactant selected from the group consisting of oxidizing polyvalent metallic ions and oxidizing polyvalent metal chelate compounds, and from about 0.1 percent to about 10 percent by weight, based on the weight of the solution, of a reaction rate modifier selected from compounds having the formula $HO—C_nH_{2n}OH$, wherein n is a number from 4 through 12, and mixtures thereof, and producing a sweet gas stream and an aqueous admixture containing crystalline sulfur and a reduced reactant;

(b) removing at least a portion of the crystalline sulfur from the aqueous admixture;

(c) regenerating the aqueous admixture in a regeneration zone with oxygen to produce a regenerated reactant;

(d) returning aqueous admixture containing regenerated reactant from the regeneration zone to the contacting zone.

4,348,369
ZEOLITE LZ-200

Richard J. Hinchey, Thornwood, and Willis W. Weber, South Salem, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 6, 1981, Ser. No. 280,377
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—328 **2 Claims**

1. A synthetic crystalline zeolite having, on an anhydrous basis, a composition expressed in terms of mole-ratios of oxides as follows;

$$0.9\text{–}1.1\ M_{2/n}O:Al_2O_3:1.9\text{–}2.4\ SiO_2,$$

where M is a cation selected from the group including alkali, alkaline earth and transition metals, ammonium and hydrogen, and n is the valence of M, said crystalline zeolite having an X-ray powder diffraction pattern containing at least those d-spacings set forth in Table A.

4,348,370
AMMONIA SYNTHESIS WITH CATALYST DERIVED BY HEATING ON A SUPPORT A SALT SELECTED FROM ALKALI METAL, ALKALINE EARTH METAL, IRON AND COBALT HEXACYANOCOBALTATES AND HEXACYANORUTHENATES

Marvin M. Johnson; Donald C. Tabler, and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 110,303, Jan. 8, 1980, Pat. No. 4,309,311.
This application Sep. 21, 1981, Ser. No. 304,271
Int. Cl.³ C01C *1/04*
U.S. Cl. 423—362 **8 Claims**

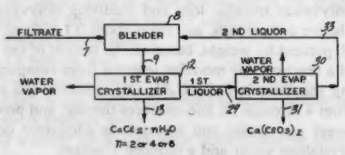
1. A process for the synthesis of ammonia which comprises reacting, under ammonia synthesis conditions, hydrogen and nitrogen in the presence of a catalyst comprising a salt on a support wherein said salt is selected from the group consisting of:

an alkali metal hexacyanoruthenate,
an alkali metal hexacyanocobaltate,
an alkaline earth metal hexacyanoruthenate,
an alkaline earth metal hexacyanocobaltate,
iron hexacyanoruthenate,
iron hexacyanocobaltate,
cobalt hexacyanoruthenate, and
cobalt hexacyanocobaltate.

4,348,371
PROCESS FOR THE RECOVERY OF CALCIUM SALTS FROM CALCIUM HYPOCHLORITE PROCESS EFFLUENTS

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed May 4, 1981, Ser. No. 260,641
Int. Cl.³ C01B *11/14*; C01F *11/24*
U.S. Cl. 423—475 **12 Claims**



1. A process for the recovery of calcium chloride hydrates and anhydrous calcium chlorate from calcium hypochlorite process effluents which comprises:

(a) neutralizing said calcium hypochlorite process effluent by the addition of an acid to form a neutralized effluent comprised of an aqueous solution of calcium chloride, calcium chlorate, and calcium hypochlorite and having a weight ratio of $Ca(ClO_3)_2/CaCl_2$ of less than about 0.2;

(b) blending said neutralized effluent with a second mother liquor comprised of an aqueous solution of calcium chlorate and calcium chloride and having a weight ratio of $Ca(ClO_3)_2/CaCl_2$ of greater than about 1.0, to form a blended solution;

(c) feeding said blended solution to a first crystallizer to form a slurry of calcium chloride hydrate in a first mother liquor;

(d) separating said crystals of said calcium chloride hydrate from said first mother liquor, said first mother liquor having a weight ratio of $Ca(ClO_3)_2/CaCl_2$ of at least about 1.0;

(e) feeding said first mother liquor to an evaporative crystallizer to form a crystalline anhydrous calcium chlorate compound;

(f) separating said crystalline anhydrous calcium chlorate compound from a second mother liquor;

(g) recovering said crystalline anhydrous calcium chlorate compound; and

(h) returning said second mother liquor to step (b).

4,348,372
PROCESS FOR THE RECOVERY OF CALCIUM CHLORIDE FROM CALCIUM HYPOCHLORITE PROCESS EFFLUENTS

Budd L. Duncan, Athens, and Ian L. Madden, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed May 4, 1981, Ser. No. 260,653
Int. Cl.³ C01F *11/24*
U.S. Cl. 423—497 **8 Claims**

1. A process for the recovery of calcium chloride hydrates from calcium hypochlorite process effluents which comprises:

(a) acidifying an effluent comprised of an aqueous solution of calcium chloride, calcium hypochlorite, and calcium chlorate with a chlorine-containing compound selected from the group consisting of chlorine, hydrochloric acid, and hydrogen chloride to form an acidic aqueous solution of calcium chloride having reduced concentrations of calcium hypochlorite;

(b) evaporating water from said acidic aqueous solution to produce a concentrated acidic aqueous solution containing at least 45 percent by weight of calcium chloride;

(c) feeding said concentrated acidic aqueous solution of calcium chloride to a crystallizer to form crystals of a calcium chloride hydrate selected from the group consisting of calcium chloride dihydrate, calcium chloride tetrahydrate, calcium chloride hexahydrate and mixtures thereof;

(d) separating said crystals of said calcium chloride hydrate from a waste liquor; and

(e) recovering said crystals of said calcium chloride hydrate.

4,348,373
PROCESS FOR THE PREPARATION OF SULFURIC ACID

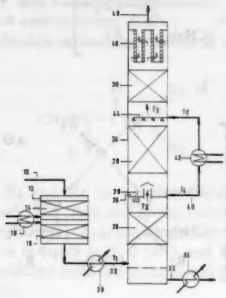
Peter C. S. Schoubye, Horsholm, Denmark, assignor to Haldor Topsoe A/S, Lyngby, Denmark

Filed Mar. 12, 1981, Ser. No. 243,097
Claims priority, application Denmark, Mar. 25, 1980, 1282/80
Int. Cl.³ C01B *17/88*
U.S. Cl. 423—522 **4 Claims**

1. In a process for preparing sulfuric acid, comprising the steps of passing, in a sulfuric acid tower, a gas stream containing sulfur trioxide and sulfuric acid vapour in a total amount of up to 10% by volume and water vapour in an amount of up to 50% by volume in countercurrent with formed liquid sulfuric acid through a concentrating zone containing filler bodies trickled with sulfuric acid and subsequently an absorption zone wherein sulfuric acid vapour is absorbed in recycled sulfuric acid on filler bodies trickled therewith, the improvement con-

sisting in maintaining in the sulfuric acid tower such temperature conditions that the recycle acid is removed from the tower at a temperature of T_4°C., determined by the formula

$$T_4 > 140 + 6\alpha + \beta + 0.2(T_1 - T_d)$$



where α is the concentration in % by volume of $SO_3 + H_2SO_4$-vapour in the inlet gas entering the tower, β the concentration in % by volume of water vapour in the same inlet gas, T_1 the temperature of the same inlet gas in °C. and T_d the dew point of the sulfuric acid vapour in the same inlet gas in °C.

4,348,374

CHARCOAL COATED ADSORBENT DEVICE

Kue H. Chau, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 833,791, Sep. 16, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,455

Int. Cl.³ G01N *33/54, 33/56, 23/06*

U.S. Cl. 424—1 **5 Claims**

5. A ligand binding assay for proteins in a physiological fluid which comprises:

a. introducing an aliquot of the specimen to be assayed into a vial containing a labeled ligand and an activated charcoal-coated solid support of regular geometric form;

b. allowing the contents of the vial to incubate;

c. separating the solid phase containing unbound ligands adsorbed on the activated charcoalcoated solid support from the liquid phase containing protein bound ligand; and

d. determining the quantity of labeled ligand in either phase which is a function of the degree of ligand binding in the sample fluid.

4,348,375

RADIOASSAY PROCESS AND COMPOSITIONS USEFUL THEREIN

Wilhelmus T. Goedemans, Schoorl, Netherlands, assignor to Byk-Mallinckrodt CIL B.V., Netherlands

Filed Dec. 31, 1979, Ser. No. 108,575

Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1 **13 Claims**

1. A method for radioassaying a warmblooded animal which comprises administering to said animal an essentially organic solvent-free, aqueous solution containing a small amount of a radioactive indium-8-hydroxyquinoline or blood cells radioactivity labeled by said solution, said amount being sufficient for detection by external imaging, and subjecting said animal to external imaging for detecting accumulated radioactivity to determine its location in the body of said animal.

4,348,376

TUMOR LOCALIZATION AND THERAPY WITH LABELED ANTI-CEA ANTIBODY

Milton D. Goldenberg, 11837 Gainsborough Rd., Potomac, Md. 20854

Filed Mar. 3, 1980, Ser. No. 126,262

Int. Cl.³ A61K *49/00*

U.S. Cl. 424—1 **39 Claims**

1. In a method for determining the location of a tumor which either produces or is associated with carcinoembryonic antigen (CEA), which comprises injecting a human subject parenterally with an antibody specific to CEA and radiolabeled with a pharmacologically inert radioisotope capable of detection using a photoscanning device and subsequently scanning the subject with said device to determine the location of the resultant uptake of said labeled antibody by said tumor;

the improvement which comprises concurrently injecting said human subject with normal immunoglobulin from the same or different species as that used to prepare said specific antibody, said normal immunoglobulin being radiolabeled with a different radioisotope of the same element used to label the specific antibody and emitting at an energy capable of independent detection using said photoscanning device, the level of activity of the labeled normal immunoglobulin being used to determine the distribution of background activity due to non-targeted specific antibody, said distribution being subtracted from the total activity of specific antibody whereby the activity of substantially only the targeted tumor-associated antibody is determined.

4,348,377

NEW DERIVATIVES OF 2,4,6-TRIIODO-ISOPHTHALIC ACID, PROCESES FOR THEIR SYNTHESIS AND X-RAY CONTRASTING MATERIALS CONTAINING THESE

Ernst Felder, Vitale, Switzerland, and Davide Pitre, Milan, Italy, assignors to Bracco Industria Chimica S.p.A., Milan, Italy

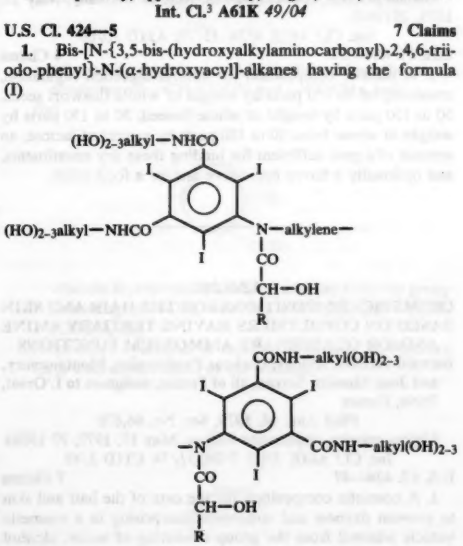
Filed Jul. 30, 1980, Ser. No. 173,765

Claims priority, application Italy, Aug. 9, 1979, 25027 A/79

Int. Cl.³ A61K *49/04*

U.S. Cl. 424—5 **7 Claims**

1. Bis-[N-{3,5-bis-(hydroxyalkylaminocarbonyl)-2,4,6-triiodo-phenyl}-N-(α-hydroxyacyl]-alkanes having the formula (I)



wherein

(HO)$_{2-3}$alkyl is 1,3-dihydroxyisopropyl, 2,3-dihydroxypropyl, or 1,3-dihydroxy-2-hydroxymethylisopropyl,

R is hydrogen or methyl, and

alkylene is a bivalent alkylene residue with 2 to 10 carbon atoms which may be substituted by hydroxy functions, or a mono-, di-or poly-oxa-alkylene residue with 4 to 12 carbon atoms, which may be substituted by hydroxy functions.

4,348,378

PLAQUE DISCLOSING DENTIFRICE COMPOSITIONS WITH SEMI-SOLID MICROCAPSULES OF DYE

Carl M. Kosti, 704 Foxhall Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 65,078, Aug. 9, 1979, abandoned. This application Oct. 7, 1980, Ser. No. 194,921

Int. Cl.³ A61K *7/16, 7/18*

U.S. Cl. 424—7 **21 Claims**

1. A diagnostic plaque disclosing dentifrice composition for topical application to the teeth comprising a continuous water soluble phase, and a discontinuous water insoluble phase dispersed in said water soluble phase, said water insoluble phase comprising selectively rupturable dye elements, with a dental plaque disclosing substance dispersed in said rupturable dye elements, whereby said dental plaque disclosing substance may be topically applied to said teeth by rupturing said selectively rupturable dye elements.

4,348,379

DIETETIC COMPOSITION FOR NATURAL DIGESTION REGULATION

Horst Kowalsky, Marzellenstrasse 1, Cologne 1, Fed. Rep. of Germany (5000), and Horst Scheer, Poststrasse 17, Bad Neuenahr, Fed. Rep. of Germany (5483)

Filed May 5, 1980, Ser. No. 146,495

Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919449

Int. Cl.³ A61K *9/34, 35/78;* A21D *10/00*

U.S. Cl. 424—34 **4 Claims**

1. A dietetic composition for natural digestion regulation, consisting of 50 150 parts by weight of whole fleawort seeds, 50 to 150 parts by weight of whole linseed, 50 to 150 parts by weight of wheat bran, 50 to 150 parts by weight of lactose, an amount of a gum sufficient for binding these dry constituents, and optionally a flavor corrective and/or a food color.

4,348,380

COSMETIC COMPOSITIONS FOR THE HAIR AND SKIN BASED ON COPOLYMERS HAVING TERTIARY AMINE AND/OR QUATERNARY AMMONIUM FUNCTIONS

Bernard Jacquet, Antony; Christos Papantoniou, Montmorency, and Jean Mondet, Sevran, all of France, assignors to L'Oreal, Paris, France

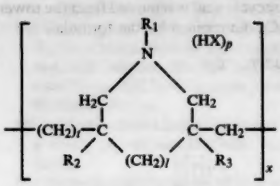
Filed Aug. 14, 1979, Ser. No. 66,678

Claims priority, application France, May 17, 1977, 77 15088

Int. Cl.³ A61K *7/00, 7/06, 31/74;* C11D *3/48*

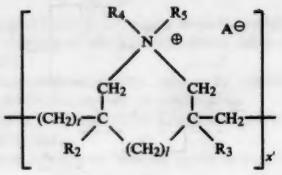
U.S. Cl. 424—47 **7 Claims**

1. A cosmetic composition for the care of the hair and skin to prevent dryness and roughness comprising in a cosmetic vehicle selected from the group consisting of water, alcohol and a hydroalcoholic solution 0.01 to 15 percent by weight of a copolymer having one or both of tertiary amine and quaternary ammonium functions, said copolymer having the formula

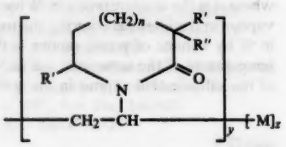


(I)

Ia



Ib



Id

Ic

wherein:

R_1, R_4 and R_5 each independently represent alkyl having 1–12 carbon atoms,

R_2 and R_3 each independently represent hydrogen or methyl,

R' and R'' each independently represent hydrogen or lower alkyl having 1–4 carbon atoms,

l is 0 or 1, if l=0, t=1 and if l=1, t=0,

n is 0, 1 or 2,

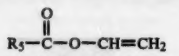
is 0 or 1,

A represents chloride or bromide,

HX is an acid selected from the group consisting of hydrochloric acid, hydrobromic acid, acetic acid and lactic acid,

M represents a unit of an unsaturated monomer selected from the group consisting of

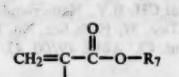
(i) a vinyl ester of the formula



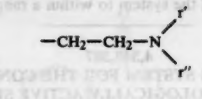
wherein R_5 represents alkyl having 1–17 carbon atoms,

(ii) a vinyl ether of the formula $R_6—O—CH=CH_2$ wherein R_6 represents alkyl having 1–16 carbon atoms,

(iii) an acrylic or methacrylic ester of the formula

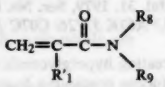


wherein R''' represents a member selected from the group consisting of hydrogen and methyl and R_7 represents a member selected from the group consisting of alkyl having 1–18 carbon atoms, alkyl having 1–3 carbon atoms and substituted by at least one alkoxy having 1–4 carbon atoms and



wherein r′ and r″ each independently represent alkyl having 1–4 carbon atoms, and

(iv) an acrylamide or methacrylamide of the formula



wherein R_8 and R_9 each independently represent a member selected from the group consisting of hydrogen, alkyl having 1–4 carbon atoms and $-(CH_2)_m-OH$ wherein m is equal to 1, 2 or 3 and R'_1 represents a member selected from the group consisting of hydrogen and methyl;

x+x′ corresponds to 95–5 mole percent wherein one of x and x′ can be 0;

y corresponds to 5–95 mole percent; and

z corresponds to 0–60 mole percent, with (x+x′)+y+z being equal to 100 mole percent; and from 0.01 to 10 weight percent of another polymer having an anionic or cationic character and cosmetic adjuvants.

4,348,381

DENTAL REMINERALIZATION COMPOSITION

Abdul Gaffar, Somerset, and Calvin B. Davis, North Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 6, 1981, Ser. No. 260,951
Int. Cl.³ A61K *7/16, 7/18*
U.S. Cl. 424—52 **16 Claims**

1. A stable aqueous remineralizing composition which comprises a solution of water having dissolved therein a source of calcium ions and a source of phosphate ions, the amount of calcium ion and phosphate ions being sufficient to effect remineralization of dental enamel; a compound which provides fluoride anticaries agent; and an antinucleating agent selected from the group consisting of 2-phosphono-butane-tricarboxylic acid-1,2,4 and water-soluble salt thereof, said solution having a pH of about 5–9.

4,348,382

DENTIFRICE COMPOSITION

Robert C. Pierce, Plainsboro, and Robert L. Mitchell, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 213,423, Dec. 5, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 313,046
Int. Cl.³ A61K *7/18*
U.S. Cl. 424—52 **2 Claims**

1. A dentifrice composition with improved soluble fluorine retention comprising about 0.05% to about 7.6% by weight of sodium monofluorophosphate and about 20–99% by weight of a compatible polishing material, at least a major portion of which is dicalcium phosphate dihydrate having a particle size such that all particles are above 3 microns in size and at least about 65% of the particles are 3–10 microns in size.

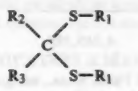
4,348,383

DITHIOETHER-BASED COSMETIC COMPOSITIONS FOR THE TREATMENT OF THE OILY STATE OF HAIR AND SKIN

Claude Bouillon, Eaubonne, and Jean Maignan, Tremblay les Gonesse, both of France, assignors to L'Oreal, Paris, France

Filed Jun. 29, 1979, Ser. No. 53,417
Claims priority, application France, Jul. 12, 1978, 78 20801
Int. Cl.³ A61K *7/06*
U.S. Cl. 424—70 **10 Claims**

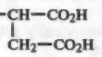
1. A cosmetic composition for the treatment of the oily appearance of the hair and skin comprising in combination, in a suitable cosmetic vehicle, (1) an effective amount of at least one active compound having the formula



(I)

wherein

R_1 represents

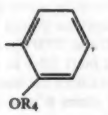


R_2 represents a member selected from the group consisting of

(i) $-C_6H_5p\text{-}OCH_3$,

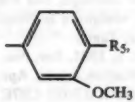
(ii) $-C_6H_5$

(iii)



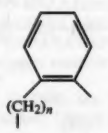
wherein R_4 represents a radical selected from the group consisting of $-CH_2COOH$ and $-COCH_3$, and

(iv)



wherein R_5 represents a radical selected from the group consisting of —OH, $-OCH_3$, $-OC_4H_9$ and $-OCH_2COOH$, and

R_3 represents hydrogen or methyl, or R_2 and R_3 together form a divalent radical of the formula,



wherein n is 2–5 inclusive, and (2) an effective amount of at least one of an anionic, cationic, nonionic or amphoteric detergent.

4,348,384

PHARMACEUTICAL COMPOSITION FOR ORAL ADMINISTRATION CONTAINING COAGULATION FACTOR VIII OR IX

Isamu Horikoshi; Nobuo Sakuragawa; Masaharu Ueno, and Kaoru Takahashi, all of Toyama, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 7, 1981, Ser. No. 309,269

Claims priority, application Japan, Oct. 17, 1980, 55/144508; Apr. 28, 1981, 56/65685

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 14 Claims

1. A pharmaceutical composition for oral administration, which comprises effective amounts of coagulation factor VIII or IX and a protease inhibitor which are incorporated in liposomes.

4,348,385

FLOWABLE PESTICIDES

Joseph Synek, Overland Park, Kans., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 17, 1980, Ser. No. 207,318

Int. Cl.³ A01N *25/22, 57/00*

U.S. Cl. 424—173 9 Claims

1. A flowable water dispersible pesticide formulation comprising

(a) a finely divided biologically active water insoluble solid pesticide compound,

(b) an organic water miscible solvent which has a solubility for said pesticide compound of between 1000 ppm and 10 wt. % at 40° C., and

(c) a sufficient amount of finely divided inert filler and dispersant effective for dispersing water insoluble substances in aqueous media to maintain said compound in stable suspension in said organic solvent and prevent either agglomeration or Ostwald ripening.

6. A storage stable, flowable, water dispersible suspension of Azinphos-methyl in propylene glycol having a viscosity after agitation of between 400 and 5000 cps at 20° C. and containing sufficient dispersant and inert filler to maintain the stability of the suspension at temperatures between 40° and 0° C.

7. The suspension of claim 6 wherein the dispersant is an alkali metal lignosulfonate.

4,348,386

PROTEASE INHIBITORS

Shinichi Kojima, Ashiya; Ten Koide, Takarazuka; Shigeo Ogino, Nishinomiya; Toshiro Tsuchiya, and Yoshito Kameno, both of Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

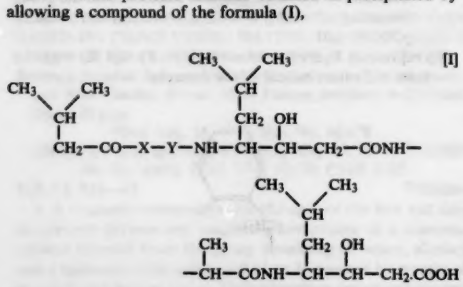
Filed Apr. 1, 1981, Ser. No. 249,984

Claims priority, application Japan, Apr. 16, 1980, 55-50725

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 23 Claims

1. An acidic protease inhibitor obtained as precipitated by allowing a compound of the formula (I),



[I]

wherein X and Y are L-leucine or L-valine, or its salt to react with an aluminum compound in a medium containing water and/or an alcohol, and further continuing the reaction after adjusting the pH of the system to within a range of 4.5 to 7.

4,348,387

METHOD AND SYSTEM FOR THE CONTROLLED RELEASE OF BIOLOGICALLY ACTIVE SUBSTANCES TO A BODY FLUID

Michael Brownlee, Watertown, Mass., and Anthony Cerami, Flanders, N.J., assignors to The Rockefeller University, New York, N.Y.

Filed Jul. 31, 1979, Ser. No. 62,484

Int. Cl.³ A61K *37/26;* C07C *103/52*

U.S. Cl. 424—178 15 Claims

1. A process of treating hyperglycemia which comprises:

delivering to a glucose containing human body fluid a reversible complex of (1) a hypoglycemically active insulin analogue which is a conjugate between a carbohydrate and an insulin and (2) a lectin having affinity for glucose and for the carbohydrate portion of said conjugate (1); thereby

causing the glucose present in said fluid to complex to said lectin and to release said conjugate into said fluid.

4,348,388

11-AMINO-11-DEOXYDAUNORUBICIN AND ANALOGS

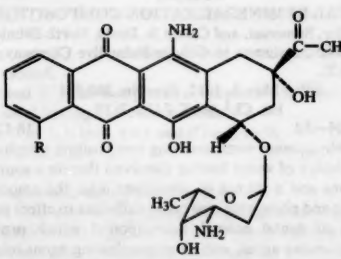
Robert B. Garland, Northbrook; Raphael Pappo, Skokie, and Paul B. Sollman, Wilmette, all of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Filed Apr. 2, 1980, Ser. No. 136,620

Int. Cl.³ A61K *31/70;* C07H *15/24*

U.S. Cl. 424—180 17 Claims

1. An 11-amino-11-deoxydaunorubicin derivative represented by the formula:



wherein: R is hydrogen, hydroxy or methoxy; R_1 is hydrogen or hydroxy; and the pharmaceutically acceptable salts thereof.

13. A pharmaceutical composition for parenteral administration comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,348,389

QUINOXALINE ADDUCTS USEFUL AS ANTHELMINTICS

Vernon V. Young, Terre Haute, and David R. Bright, West Terre Haute, both of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

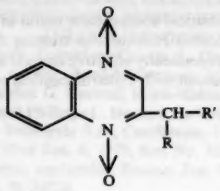
Filed Aug. 7, 1980, Ser. No. 176,168

Int. Cl.³ A61K *31/63, 31/495, 31/635*

U.S. Cl. 424—228 9 Claims

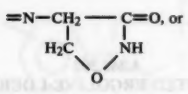
6. The method of inhibiting parasitic helminths in animal digestive systems which comprises orally administering an inhibitory amount of a substituted quinoxaline compound to said animal, said quinoxaline compound being selected from the group consisting of:

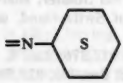
(a) a compound represented by the formula

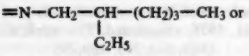


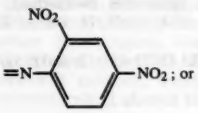
where R and R′ collectively are

=NOCH$_2$COOCH$_3$, (a)

 (b)

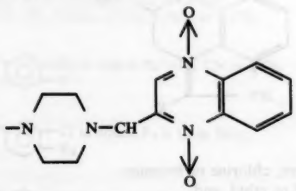
 (c)

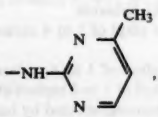
 (d)

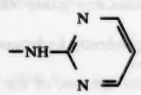
 (e)

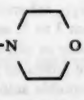
=NNHCO$_2$CH$_3$; (f)

or R is hydroxyl or alkoxy and R′ is

 (g)

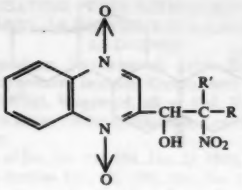






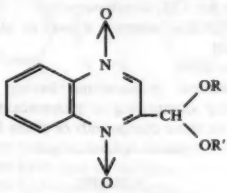
—NHOH; (h)

(b) nitrohydroxyalkylquinoxaline-1,4-dioxides represented by the formula



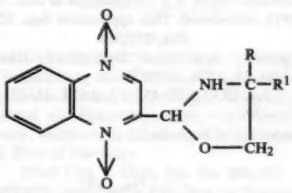
where R is hydrogen, lower alkyl of 1–3 carbon atoms, hydroxymethyl or acetoxymethyl and R′ is hydrogen or lower alkyl of 1–2 carbon atoms or R and R′ taken together constitute an alkylene group of five carbon atoms;

(c) A substituted quinoxaline-1,4-dioxide represented by the formula



where R and R′ are hydrogen or collectively R and R′ are —(CH$_2$)$_x$— or —CH$_2$CHOHCH$_2$—, or —CH$_2$C(CH$_2$OH)(NO$_2$)CH$_2$— where x is an integer of 2 to 4; and

(d) substituted quinoxaline dioxides represented by the formula



where R and R^1 can be hydrogen, methyl, ethyl or hydroxymethyl and can be the same or different.

4,348,390

(i) **NOVEL BIS- AND MONO-QUATERNARY AMMONIUM DERIVATIVES OF 2β,16β-DIPIPERIDINO-5α-ANDROSTANES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL PREPARATIONS**

(j) **Jan Kelder, Oss, Netherlands, assignor to AKZO nv, Oss, Netherlands**

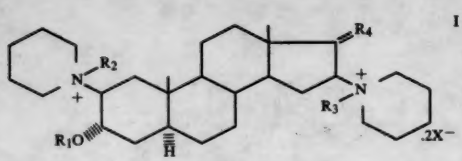
Filed Dec. 10, 1980, Ser. No. 214,650

Claims priority, application United Kingdom, Dec. 12, 1979, 7942883

(k) **Int. Cl.^{3} A61K *31/58*; C07J *43/00***

U.S. Cl. 424—241 **6 Claims**

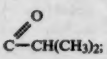
1. Novel bisquaternary ammonium derivatives of 2β,16β-dipiperidino-5α-androstanes having the formula I:



I

wherein

R_1=



R_2=CH_3, C_2H_5 or $CH_2CH{=}CH_2$;

R_3=CH_3, C_2H_5 or $CH_2CH{=}CH_2$, with the proviso that R_2 and R_3 are not CH_3 simultaneously;

R_4=O or H(βOR_5), wherein R_5=H or aliphatic carbacyl (1–6 C); and

X=a halogen atom.

6. Pharmaceutical preparations having neuromuscular blocking activity comprising a pharmaceutically effective amount of one or more compounds of claim 1.

4,348,391

SULFONAMIDO AND SULFAMOYLAMINO-ERGOLINE-I DERIVATIVES

Peter Stütz, Vienna, Austria; Theodor Fehr, Dornach, and Paul Stadler, Biel-Benken, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

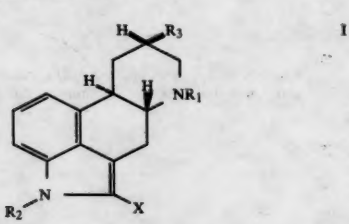
Continuation of Ser. No. 973,158, Dec. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 896,703, Apr. 17, 1978, abandoned, which is a continuation of Ser. No. 752,070, Dec. 20, 1976, abandoned. This application Sep. 22, 1980, Ser. No. 189,068

Claims priority, application Switzerland, Dec. 23, 1975, 16680/75; May 18, 1976, 6188/76

Int. Cl.[3] **C07D** *457/12;* **A61K** *31/48*

U.S. Cl. 424—246 **12 Claims**

1. A compound of formula I,



I

wherein

X is hydrogen, chlorine or bromine,

R_1 is methyl or ethyl,

R_2 is alkyl of 1 to 4 carbon atoms or allyl,

R_3 is a group —NR_4R_5, wherein R_4 is hydrogen or alkyl of 1 to 4 carbon atoms, and R_5 is SO_2R_6, wherein R_6 is alkyl of 1 to 4 carbon atoms, mono-, di- or tri-haloalkyl of 1 to 4 carbon atoms, phenyl, phenyl mono-substituted by halogen or alkoxy of 1 to 4 carbon atoms, or pyridyl, or R_6 is a group NR_7R_8, wherein R_7 and R_8 are, independently, hydrogen or alkyl of 1 to 4 carbon atoms, or R_7 and R_8 together form —$[CH_2]_n$— or —$[CH_2]_2$—A—$[CH_2]_2$—, wherein n is a whole number from 3 to 7, and A is oxygen, sulphur, or nitrogen substituted by alkyl of 1 to 4 carbon atoms or phenyl,

in free base form or in pharmaceutically acceptable acid addition salt form.

3. A pharmaceutical composition useful in inhibiting lactation, treating Morbus Parkinson or treating depression which comprises a therapeutically effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4,348,392

8α-SUBSTITUTED ERGOLINE-I DERIVATIVES

Theodor Fehr, Dornach; Paul Stadler, Biel-Benken, and Peter Stütz, Bottmingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

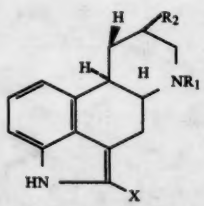
Continuation of Ser. No. 912,876, Jun. 5, 1978, abandoned, which is a continuation of Ser. No. 825,598, Aug. 19, 1977, abandoned, which is a continuation of Ser. No. 725,431, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 595,161, Jul. 11, 1975, abandoned. This application Sep. 22, 1980, Ser. No. 189,295

Claims priority, application Switzerland, Jul. 19, 1974, 9983/74; Aug. 13, 1974, 11031/74; United Kingdom, Jan. 2, 1976, 48/76

Int. Cl.[3] **C07D** *457/12;* **A61K** *31/48*

U.S. Cl. 424—246 **29 Claims**

1. A compound of formula I,



I

wherein

X is hydrogen, chlorine or bromine,

R_1 is methyl or ethyl, and

R_2 is a group NR_3R_4, wherein

R_3 is hydrogen or alkyl of 1 to 4 carbon atoms, and

R_4 is SO_2R_5,

wherein R_5 is alkyl of 1 to 4 carbon atoms, mono- to tri-halogenalkyl of 1 to 4 carbon atoms, phenyl, pyridyl, phenyl monosubstituted by halogen or alkoxy of 1 to 4 carbon atoms, or a group NR_6R_7, wherein each of

R_6 and R_7 is independently hydrogen or alkyl of 1 to 4 carbon atoms, or

R_6 and R_7 together are one of the groups $(CH_2)_n$ or $(CH_2)_2$—A—$(CH_2)_2$, wherein

n is a number from 3 to 7, and

A is oxygen, sulphur or nitrogen substituted by alkyl of 1 to 4 carbon atoms or phenyl,

or a pharmaceutically acceptable acid addition salt.

4. A pharmaceutical composition useful in inhibiting prolactin secretion or treating Morbus Parkinson comprising a therapeutically effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4,348,393

N-ARYL OXAZOLIDINONES, OXAZOLIDINETHIONES, PYRROLIDINONES, PYRROLIDINES AND THIAZOLIDINONES

Guy R. Bourgery, Colombes; Colette A. Douzon, Paris; Jean-Francois R. Ancher, Rueil-Malmaison; Alain P. Lacour, La Varenne; Patrick G. Guerret, Rueil-Malmaison; Michel Langlois, Buc, and Philippe L. Dostert, Le Vesinet, all of France, assignors to Delalande S.A., Courbevoie, France

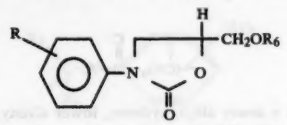
Filed Jun. 4, 1979, Ser. No. 45,143

Claims priority, application France, Jun. 9, 1978, 78 17388; Aug. 17, 1978, 78 24024

Int. Cl.³ A61K *31/42, 31/535;* C07D *263/06, 275/10*

U.S. Cl. 424—248.57 19 Claims

1. A compound having the formula



wherein R_6 is alkyl having 1 to 5 carbon atoms, cyclohexyl, allyl, propargyl or methoxymethyl, and R is (1) methyl in meta position or (2) is in para position and is selected from the group consisting of alkoxy having from 4 to 6 carbon atoms, cycloalkylmethoxy in which the cycloalkyl has from 4 to 7 carbon atoms, 1-methyl-1-cyclopentylmethoxy, cyclopenten-1-yl methoxy, cyclohexen-1-yl methoxy, (butene-2)oxy, (3-methyl butene-2)oxy, 4-chlorobutoxy, 2-cyanoethoxy, 3-cyanopropoxy, 4-cyanobutoxy, 2-oxo-propoxy, 4-oxocyclohex-1-yl methoxy, 2-morpholino-ethoxy, N,N-dimethylamino, tetrahydropyran-4-yl methoxy, tetrahydropyran-3-yl methoxy, 3-cyanobenzyloxy,

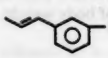
in which R_7 is hydrogen, 3-Cl, 4-Cl, 3-F, 4-F, 3-I, 3-Br, 3-CF_3, 3-NO_2, 4-NO_2 or 4-CN,

R_8 in which R_8 is Cl, CN or NO_2,

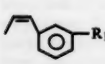
Cl in which R_9 is Cl or NO_2,

NO_2 in which R_5 is Cl or CN,

3,5-dichlorobenzyloxy,



R_{10} in which R_{10} is hydrogen, Cl, CN, or NO_2,



R_{11} in which R_{11} is hydrogen or NO_2,

, phenethyl and phenyl.

2. A pharmaceutical composition for treating depression comprising a therapeutically effective amount of a compound as claimed in claim 1 mixed with a pharmacologically acceptable carrier.

4,348,394

COMBATING PESTS WITH SUBSTITUTED 3,6-DIPHENYL-3,4-DIHYDRO-2H-1,3,5-OXADIAZINE-2,4-DIONES

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Ingeborg Hammann; Ingomar Krehan, both of Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

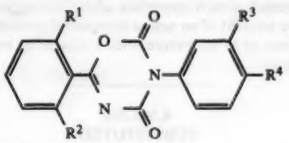
Continuation of Ser. No. 115,854, Jan. 28, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 219,751

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905687

Int. Cl.³ C07D *273/04;* A01N *9/20*

U.S. Cl. 424—248.57 8 Claims

1. An oxadiazine derivative of the formula



in which

R^1 represents halogen, methyl or ethyl,

R^2 represents hydrogen or halogen,

R^3 represents hydrogen or halogen,

R^4 represents halogenomethoxy, halogenoethoxy or halogenomethylthio, or

R^4 together with R^3 represents dioxahalogenobutanediyl.

7. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

4,348,395

1,4-DIHYDROPYRIDAZINE COMPOUNDS

Gerhard Franckowiak; Horst Meyer; Friedrich Bossert; Arend Heise; Stanislav Kazda; Kurt Stoepel; Robertson Towart, all of Wuppertal, and Egbert Wehinger, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

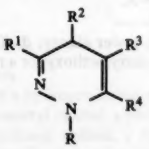
Filed Oct. 4, 1978, Ser. No. 948,599

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1977, 2745496

Int. Cl.³ A61K *31/50;* C07D *237/04*

U.S. Cl. 424—250 13 Claims

1. A compound which is 1-N-substituted 1,4-dihydropyridazine of the formula or its pharmaceutically acceptable bioprecursors:



(I)

in which:

R is a straight-chain or branched alkyl having 1 to 4 carbon atoms optionally substituted by fluorine or carboalkoxy having up to 4 carbon atoms, or is a group COR^5 wherein

R^5 is straight-chain or branched alkyl having from 1 to 4 carbon atoms optionally substituted by fluorine or phenyl or wherein

R^5 is phenyl or benzyl which is optionally substituted by methoxy, halogen or nitro

or wherein

R^5 is a group OR^6

wherein

R^6 is straight-chain or branched alkyl having from 1 to 4 carbon atoms or

R^6 is phenyl or benzyl which is optionally substituted by methoxy, halogen or nitro

R^1 is straight-chain or branched alkyl having from 1 to 4 carbon atoms optionally being substituted by halogen,

R^2 is phenyl optionally substituted by halogen, nitro, cyano or trifluoromethyl,

R^3 represents the group $COOR^8$

wherein

R^8 represents straight-chain or branched alkyl having from 1 to 4 carbon atoms, the alkyl chain being optionally interrupted by an oxygen atom and

R^4 represents alkyl having 1 or 2 carbon atoms.

10. A method of combating circulatory disorders in warm-blooded animals which comprises administering to the animals an effective amount of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,348,396

SUBSTITUTED 11-OXO-11H-PYRIDO[2,1-B]QUINAZOLINES AND METHOD OF INHIBITING ALLERGIC REACTIONS WITH THEM

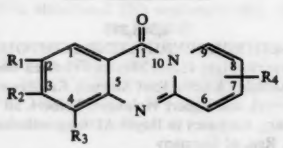
Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 871,564, Jan. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 780,939, Mar. 24, 1977, abandoned. This application May 2, 1980, Ser. No. 146,730

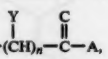
Int. Cl.³ A61K *31/505*; C07D *471/04*

U.S. Cl. 424—251 **35 Claims**

1. A compound of the formula



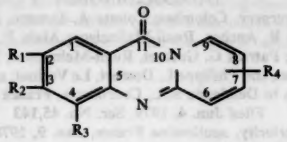
wherein R_1, R_2 and R_3, independently, are hydrogen, isopropyl, lower alkoxy, lower alkylthio, cyclopropyl, or cyclobutyl; and R_4 is cyano, hydroxy-lower alkyl, lower alkanoyloxy-lower alkyl, benzoyloxy-lower alkyl or a radical of the formula



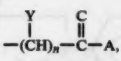
wherein A is lower alkyl, hydroxy, lower alkoxy, di-(C_1–C_7-)alkylamino-(C_2–C_7)-alkoxy, pivaloyloxymethoxy, or a radical of the formula

wherein R_5 and R_6, independently, are hydrogen, lower alkyl or di-(C_1–C_7)alkylamino-(C_2–C_7)alkyl, Y is hydrogen or methyl, and n is 0 or 1; provided that only one of R_1, R_2 or R_3 is other than hydrogen and that R_4 is present only in position 6, 7 or 8, or a pharmaceutically acceptable acid addition salt thereof, or when A is hydroxy, also a salt thereof with a pharmaceutically acceptable base.

33. Method of inhibiting allergic reactions which comprises administering an effective amount of the compound of the formula



wherein R_1, R_2 and R_3, independently, are hydrogen, isopropyl, lower alkoxy, cyclopropyl, or cyclobutyl; and R_4 is cyano, hydroxy-lower alkyl, lower alkanoyloxy-lower alkyl, benzoyloxy-lower alkyl or a radical of the formula



wherein A is lower alkyl, hydroxy, lower alkoxy, di-(C_1–C_7-)alkylamino-(C_2–C_7)-alkoxy, pivaloyloxymethoxy, or a radical of the formula

wherein R_5 and R_6, independently, are hydrogen, lower alkyl or di-(C_1–C_7)alkylamino-(C_2–C_7)alkyl, Y is hydrogen or methyl, and n is 0 or 1; provided that only one of R_1, R_2 or R_3 is other than hydrogen and that R_4 is present only in position 8, or a pharmaceutically acceptable acid addition salt thereof, or when A is hydroxy, also a salt thereof with a pharmaceutically acceptable base.

4,348,397

PROBENECID-DYPHYLLINE THERAPY

David C. May, and Charles H. Jarboe, both of Louisville, Ky., assignors to Research Corporation, New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,661

Int. Cl.³ A61U *31/19, 31/52*

U.S. Cl. 424—253 **8 Claims**

1. A method of enhancing the retention of dyphylline in the human system into which it is administered which comprises administering a retentively effective amount of probenecid to said system at substantially the time of administration of the dyphylline, wherein the amount of dyphylline administered is between about 3 and about 25 milligrams per kilogram of body weight and the amount of probenecid administered is betwen about 5 and about 20 milligrams per kilogram of body weight.

4,348,398

QUINOLINYL ETHANOLAMINES

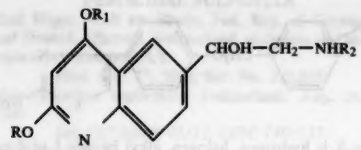
Joseph G. Atkinson, Montreal, and Burton K. Wasson, Ingleside, both of Canada, assignors to Merck Sharp & Dohme (I.A.) Corp., Rahway, N.J.

Filed Dec. 23, 1980, Ser. No. 219,728

Int. Cl.³ A61K *31/47*; C07D *215/22*

U.S. Cl. 424—258 **13 Claims**

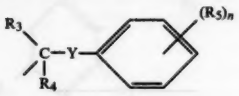
1. Compounds of the formula:



tautomers, pharmaceutically acceptable salts and individual isomers thereof wherein

R and R_1 are independently selected from H and C_1–C_3 alkyl and

R_2 is



wherein

R_3 and R_4 are independently selected from H and C_1–C_3 alkyl,

R_5 is H, OH, O—CH_{1-3} alkyl, halogen or C_{1-3} alkyl

Y is CH_2, $(CH_2)_2$, $(CH_2)_3$, $(CH_2)_4$ or —CH_2O— and

n is 1 or 2.

12. A pharmaceutical composition for (1) treating hypertension (2) reducing intraocular pressure or (3) effecting bronchodilation containing an effective amount of a compound of claim 1.

13. A method of (1) treating hypertension (2) reducing intraocular pressure or (3) effecting bronchodilation by administering an effective amount of claim 1 compound in suitable dosage form.

4,348,399

ANTIATHEROSCLEROTIC AND HYPOLIPIDEMIC 4-(MONOALKYLAMINO)PHENYL ALKANE, ALKENE AND ALKYNE CARBINOLS, ALDEHYDES, CARBOXYLIC ACIDS AND DERIVATIVES

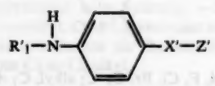
Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 2, 1978, Ser. No. 874,431

Int. Cl.³ A61K *31/44;* **C07C** *59/56, 101/48;* **A61K** *31/19, 31/20, 31/235, 31/24, 31/27*

U.S. Cl. 424—263 **7 Claims**

1. A compound represented by the following structured formula:



wherein X′ is selected from the group consisting of an unbranched or branched C_1–C_3 alkylene, C_2–C_4 alkenylene, or ethynylene; Z′ is selected from the group consisting of carboxyl, formyl, carbamoyl and $COOR_3$ wherein R_3 is selected from the group consisting C_1–C_4 branched and unbranched alkyl, C_1–C_3 alkoxyloweralkyl, di(C_1–C_3 dialkyl)aminoloweralkyl, C_1–C_3 mono- or dihydroxyalkyl, phenyl, halophenyl, 3-pyridyl, phenylmethyl, pyridylmethyl, C_3–C_5 carboalkoxyalkyl, and C_2–C_5 carboxyalkyl and R_1 is a branched or unbranched alkyl group C_nH_{2n+1} wherein n is an integer 13 to 17.

7. A compound, 4-(hexadecylmethylamino)hydrocinnamic acid.

4,348,400

PYRIDYLPROPYL ALKYL-SUBSTITUTED BENZOATES AND THEIR USE AS INSECT REPELLENTS

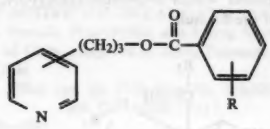
Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 7, 1981, Ser. No. 261,423

Int. Cl.³ A61K *31/44;* **C07D** *213/55*

U.S. Cl. 424—263 **4 Claims**

1. A method of repelling insects from a locus to be protected therefrom, comprising applying to said locus an effective insect repelling amount of a compound having the formula



in which R is C_1–C_4 alkyl.

4,348,401

N-PHENOXYALKYLPIPERIDINE DERIVATIVES

Walter-Gunar Friebe, Darmstadt; Wolfgang Kampe- Heddesheim; Max Thiel, Mannheim; Wolfgang Schaumann, Heidelberg, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

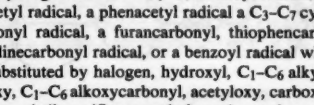
Filed Sep. 10, 1980, Ser. No. 185,839

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939292

Int. Cl.³ A61K *31/445, 31/455;* **C07D** *211/58, 409/12, 407/12, 403/12*

U.S. Cl. 424—267 **6 Claims**

1. An N-phenoxyalkylpiperidine derivative of the formula



wherein

R_1 is a hydrogen atom or a C_1–C_7 alkanoyl radical, a trifluoroacetyl radical, a phenacetyl radical a C_3–C_7 cycloalkylcarbonyl radical, a furancarbonyl, thiophencarbonyl or pyridinecarbonyl radical, or a benzoyl radical which may be substituted by halogen, hydroxyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkoxycarbonyl, acetyloxy, carboxyl, nitro, amino, nitrile, trifluoromethyl, carbamoyl, methylmercapto, methylsulfinyl, methylsulfonyl, acetyl, benzoyl, acetylamino, hydroxymethyl or C_1–C_6 alkoxy C_1–C_6 alkyl,

R_2 is a 1H tetrazol-5-yl radical,

X is an imino group, and

A is an alkylene radical containing 2 to 4 carbon atoms, or a pharmacologically acceptable salt thereof.

4,348,402

2-HYDROXYALKYL-3,4,5-TRIHYDROXY-PIPERIDINE COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

Günther Kinast; Lutz Müller; Rüdiger Sitt, and Walter Puls, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

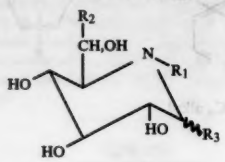
Filed Oct. 2, 1980, Ser. No. 193,498

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942365

Int. Cl.³ A61K *31/445;* **C07D** *211/42*

U.S. Cl. 424—267 **19 Claims**

1. A compound which is 2-hydroxyalkyl-3,4,5-trihydroxypiperidine of the formula



(I)

in which

R_1 denotes a hydrogen atom

R_2 denotes a C_1 to C_{10} alkyl, C_2 to C_6 alkenyl or C_4 to C_{10} alkadienyl radical which is optionally substituted by hydroxyl, C_1 to C_4 alkoxy or phenyl, which can in turn be substituted by C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halogen, nitro or cyano, or denotes a phenyl radical which is optionally substituted by C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halogen, nitro or cyano, and

R_3 denotes a hydrogen atom or a sulpho or hydroxyl group.

10. A pharmaceutical composition containing as an active ingredient an amount effective for the treatment of adiposity, diabetes or hyperlipoproteinaemia of a compound according to claim **1**, in admixture with an inert pharmaceutical carrier.

4,348,403

2-AMINO-4-(4-BENZYLOXYPHENYL)THIAZOLES, AND THEIR USE IN HYPERLIPEMIA

Yutaka Kawamatsu, Kyoto; Takashi Sohda, Takatsuki, and Yoshio Imai, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

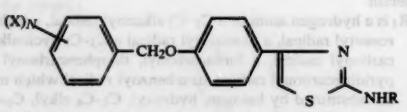
Filed Oct. 16, 1980, Ser. No. 197,755

Claims priority, application Japan, Oct. 17, 1979, 54/134489

Int. Cl.³ A61K *31/425;* **C07D** *277/40, 277/42, 277/46*

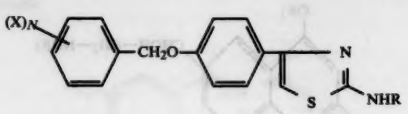
U.S. Cl. 424—270 **8 Claims**

1. A compound of the formula:



wherein X is hydrogen, halogen, alkyl having 1 to 4 carbon atoms or trifluoromethyl; R is hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, formyl or alkylcarbonyl having 2 to 6 carbon atoms; and n is 1 or 2, or a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition which contains an effective amount, for the therapy of hyperlipemia in mammals, of a compound of the formula:



wherein X is hydrogen, halogen, alkyl having 1 to 4 carbon atoms or trifluoromethyl; R is hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, formyl or alkylcarbonyl having 2 to 6 carbon atoms; and n is 1 or 2, or a pharmaceutically acceptable salt thereof, and

a pharmaceutically acceptable carrier, vehicle or diluent therefor.

4,348,404

ANTIINFLAMMATORY 4,5-DIARYL-α-POLYFLUOROALKYL-1H-IMIDAZOLE-2-METHANAMINES

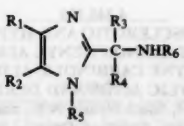
Joel G. Whitney, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 170,871, Jul. 21, 1980, abandoned. This application Jun. 15, 1981, Ser. No. 271,276

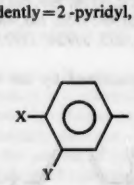
Int. Cl.³ A61K *31/415, 31/44;* **C07D** *233/64, 401/04*

U.S. Cl. 424—273 R **27 Claims**

1. A compound of the formula



R_1 and R_2 independently = 2-pyridyl, 3-pyridyl, 4-pyridyl or



where X = H, F, Cl, Br, C_1–C_2 alkyl, C_1–C_2 alkoxy, di(C_1–C_2 alkyl)amino, (C_1–C_2 alkyl)$S(O)_n$ or NO_2; where n = 0, 1 or 2;

Y = H, F or Cl; provided when Y = F or Cl, then X must be F or Cl; further provided that only one of R_1 and R_2 can be selected from the group of 2-pyridyl and 4-pyridyl;

R_3 and R_4 independently = H, CF_3, CF_2H, CF_2Cl, $CFCl_2$ or CF_2CF_3; provided that no more than one of R_3 or R_4 is H; and further provided that no more than one of R_3 or R_4 is CF_2CF_3;

R_5 and R_6 independently = H or C_1–C_3 alkyl; or a pharmaceutically suitable acid addition salt thereof.

19. A method for treatment of inflammation in a mammal which comprises administering to the mammal an antiinflammatory amount of a compound of claim **1**.

4,348,405

PESTICIDAL SULFENYLS

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

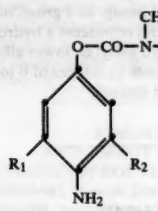
Filed Aug. 17, 1981, Ser. No. 293,805

Claims priority, application Switzerland, Aug. 26, 1980, 6419/80

Int. Cl.³ A01N *41/12*; C07C *149/237*

U.S. Cl. 424—298 10 Claims

1. A N-sulfenyl-N-methylcarbamate, or a salt thereof with an inorganic or organic acid, of the formula



wherein R_1 is C_1–C_4 alkyl, R_2 is hydrogen or methyl, and each of R_3 and R_4 is methyl or, together with the carbon atom to which they are attached, both are a cyclopentyl radical.

9. A method of controlling pests of animals and plants at a locus, which comprises applying to said locus a compound according to claim 1.

4,348,406

NOVEL GUANIDINE DERIVATIVES

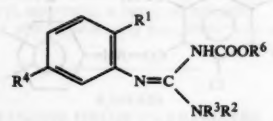
M. Mehdi Nafissi-Varchei, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Oct. 20, 1980, Ser. No. 198,424

Int. Cl.³ A23L *3/34*; C07C *79/46, 149/40, 143/67*

U.S. Cl. 424—300 9 Claims

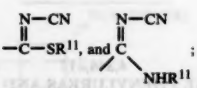
1. A compound of the formula



wherein

R^1 is hydrogen, halo, nitro, $NHCOR^8$, or $NHSO_2R^8$;

R^2 and R^3 are independently selected from hydrogen, N-alkyl piperidyl, wherein the alkyl group has 1 to 4 carbon atoms, tetrahydropyranyl, morpholinyl, piperidyl, C_1 to C_6 alkyl substituted with hydroxy, $—SCH_3$, $COOR^{10}$, piperazinyl, pyridyl, COR^9, amino, and substituted amino, wherein the substituents on the substituted amino are selected from C_1 to C_6 alkyl,



;

R^4 is C_1 to C_6 alkoxy;

R^6 is C_1 to C_6 alkyl and C_1 to C_6 alkyl substituted with C_1 to C_6 alkoxy, hydroxy, or amino;

R^8 is C_1 to C_6 alkyl, C_1 to C_6 alkyl substituted with phenyl or with halo, phenyl, or phenyl substituted with C_1 to C_6 alkyl or with halo;

R^9 is C_1 to C_6 alkyl, C_1 to C_6 acyl, or a peptide residue having up to three amino acids;

R^{10} is hydrogen or C_1 to C_6 alkyl;

R^{11} is C_1 to C_6 alkyl;

and the pharmaceutically acceptable acid addition salts thereof.

4,348,407

ORALLY ACTIVE TOLCICLATE AND TOLNAFTATE

Anthony R. Imondi, Westerville, and Irving Shemano, Columbus, both of Ohio, assignors to Adria Laboratories, Inc., Columbus, Ohio

Filed Apr. 29, 1981, Ser. No. 258,830

Int. Cl.³ A61K *31/27*

U.S. Cl. 424—300 7 Claims

1. A process of suppressing fungal disease which comprises orally administering to a person infected therewith a therapeutically effective amount for antifungal purposes of an antifungal agent selected from the group consisting of tolciclate and tolnaftate.

4,348,408

PESTICIDAL α-ALLENYL-3-PHENOXYBENZYL-2,2-DIMETHYL-3-(2,2-DIHALOVINYL)-CYCLOPROPANE-1-CARBOXYLATES

Peter Ackermann, Reinach; Laurenz Gsell, Basel, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

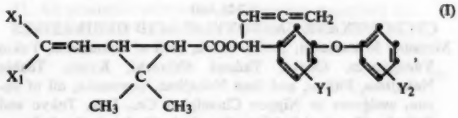
Filed Aug. 12, 1981, Ser. No. 292,080

Claims priority, application Switzerland, Aug. 22, 1980, 6353/80; Jun. 30, 1981, 4304/81

Int. Cl.³ C07C *69/743*; A01N *53/00*

U.S. Cl. 424—305 12 Claims

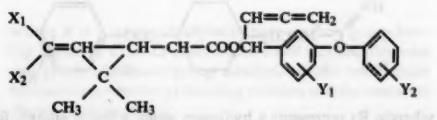
1. A cyclopropanecarboxylic acid α-allenyl-3-phenoxybenzyl ester of the formula



(I)

wherein X_1 is halogen and each of Y_1 and Y_2 is hydrogen or halogen.

11. A method of controlling insects and acarids at a locus, which method comprises applying to said locus an insecticidally or acaricidally effective amount of a cyclopropanecarboxylic acid α-allenyl-3-phenoxybenzyl ester of the formula



wherein X_1 is halogen and each of Y_1 and Y_2 is hydrogen or halogen.

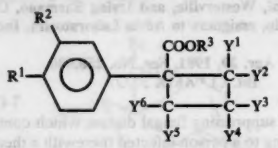
4,348,409

INSECTICIDAL ESTERS

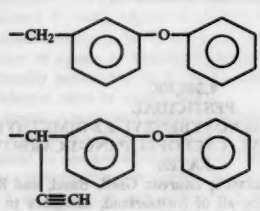
George Holan, Brighton, and David F. O'Keefe, Mt. Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australian Capital Territory, Australia

Continuation-in-part of Ser. No. 969,862, Dec. 15, 1978, Pat. No. 4,235,926. This application Jun. 20, 1979, Ser. No. 50,209
Claims priority, application Australia, Dec. 19, 1977, PD2818
Int. Cl.[3] A01N *37/10;* C07C *149/40*
U.S. Cl. 424—308 10 Claims

1. The (+), (−) and (±) forms of the compounds of the general formula I



wherein R^1 is hydrogen, fluorine, chlorine, bromine, or a methoxy, ethoxy, propoxy, butoxy, tetrafluoroethoxy, methylthio, ethylthio, propylthio, methyl, ethyl, or nitro group, and R^2 is hydrogen or a methyl group; R^3 is one of the following groups (a) or (b):



(a)

(b)

and Y^1, Y^2, Y^3, Y^4 are all fluoro and Y^5 and Y^6 are hydrogen.

5. Insecticidal compositions comprising an insecticidally effective amount of one or more of the compounds of formula I, as stated in claim 1, where R^3 is one of the groups (a) or (b), incorporated in a suitable inert liquid or solid carrier.

10. The use as insecticides of an insecticidally effective amount of any of the compounds claimed in claim 1.

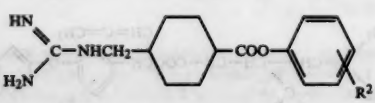
4,348,410

CYCLOHEXANE CARBOXYLIC ACID DERIVATIVES

Mutsumi Muramatsu; Toshio Satoh, both of Tokushima; Yukio Yanagimoto, Osaka; Tadami Shinuchi, Kyoto; Toshio Nakajima, Fujimi, and Isao Nakajima, Toyonaka, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo and Teikoku Chemical Industry Co., Ltd., Osaka, both of, Japan

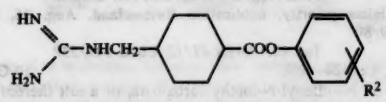
Filed Sep. 15, 1980, Ser. No. 186,849
Claims priority, application Japan, Sep. 20, 1979, 54-120142; Dec. 26, 1979, 54-168271; Dec. 26, 1979, 54-168272
Int. Cl.[3] A61K *31/24, 31/215;* C07C *69/773, 69/614*
U.S. Cl. 424—309 11 Claims

1. A compound of the formula:



wherein R_2 represents a hydrogen atom, a lower alkoxy, formyl, lower alkanoyl, phenyl group, or a group of the formula, $-(CH_2)_nCOOR_3$, wherein R_3 represents a hydrogen atom, or a lower alkyl, phenyl, benzyl, anisyl or lower alkoxycarbonylmethyl group, and n represents an integer of 0 to 2, or a pharmaceutically acceptable salt thereof.

8. An anti-ulcer agent comprising a compound of the formula:



wherein R_2 represents a hydrogen atom, a lower alkoxy, formyl, lower alkanoyl, phenyl group, or a group of the formula, $-(CH_2)_nCOOR_3$, wherein R_3 represents a hydrogen atom, or a lower alkyl, phenyl, benzyl, anisyl or lower alkoxycarbonylmethyl group, and n represents an integer of 0 to 2, or a pharmaceutically acceptable salt thereof.

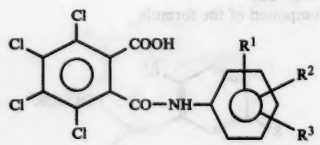
4,348,411

COMBATING BACTERIA WITH HALOGENOMETHYLSULPHONYLPHENYL-PHTHALAMIC ACIDS

Engelbert Kühle, Bergisch-Gladbach; Peter Kraus, Cologne, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 272,858
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025221
Int. Cl.[3] C07C *147/13;* A61K *31/195*
U.S. Cl. 424—319 6 Claims

1. A halogenomethylsulphonylphenyl-phthalamic acid of the formula



in which

R^1 represents a trifluoromethylsulphonyl, difluorochloromethylsulphonyl or fluorodichloromethylsulphonyl group,

R^2 represents hydrogen, chlorine, fluorine or a methyl or methoxy group and

R^3 represents hydrogen, chlorine or a methyl, methoxy, methylmercapto or phenoxy group, which group may optionally be substituted by halogen and/or methyl and-/or methoxy, or a salt thereof.

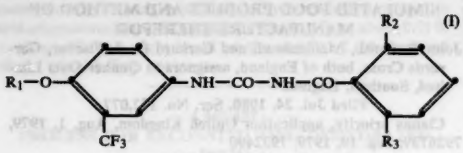
4,348,412

INSECTICIDAL PHENYLUREAS AND METHODS OF USE THEREOF

Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,634
Claims priority, application Switzerland, Jul. 11, 1979, 6475/79; Nov. 22, 1979, 10417/79; Jun. 3, 1980, 4286/80
Int. Cl.[3] A01N *47/28;* C07C *127/22*
U.S. Cl. 424—322 8 Claims

1. A compound of the formula I



wherein

R_1 is the $—CF_2—CHF—CF_3$ group,

R_2 is fluorine or chlorine, and

R_3 is hydrogen, fluorine or chlorine.

7. A method for combatting insects which comprises applying to said insects or to a locus desired to be protected from said insects an insecticidally effective amount of a compound according to claim 1.

4,348,413

ANTI-ARRHYTHMIC N-[3-ALKYLAMINOPROPYL]-N'-PHENYLUREAS

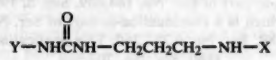
Theodore S. Sulkowski, Wayne; James L. Bergey, Lansdale, and Albert A. Mascitti, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 40,608, May 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 921,295, Jul. 3, 1978, Pat. No. 4,224,242. This application Sep. 22, 1980, Ser. No. 189,556

Int. Cl.³ A61K *31/17;* **C07C** *127/19*

U.S. Cl. 424—322 **13 Claims**

1. A method of suppressing cardiac arrhythmias in warm-blooded animals comprising administering to an animal in need thereof an amount effective to suppress such arrhythmia of a compound of the formula:



wherein:

Y is 2,6-dimethylphenyl, 2,5-dimethylphenyl, 5-bromo-2-methylphenyl, or 5-chloro-2-methylphenyl; and

X is n-propyl, isopropyl, n-butyl, or isobutyl;

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,348,414

CYCLOBUTANONE OXIME CARBAMATES, AND USE THEREOF IN PEST CONTROL

Laurenz Gsell, Basel, and Jean-Claude Gehret, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

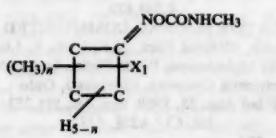
Filed Apr. 9, 1981, Ser. No. 252,527

Claims priority, application Switzerland, Apr. 24, 1980, 3170/80; Feb. 16, 1981, 1007/81

Int. Cl.³ A01N *33/24*

U.S. Cl. 424—327 **10 Claims**

1. A compound of the formula



wherein n is 1 to 5 and X_1 is hydrogen, halogen, C_1–C_4alkoxy or C_1–C_4alkylthio.

9. An insecticidal and acaricidal composition which contains an insecticidally or acaricidally effective amount of a compound according to claim 1, together with a suitable carrier.

10. A method for controlling insects and acarids which comprises applying to the locus of said insects and acarids an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,348,415

COSMETIC AND EMULSIFIER COMPOSITIONS

Hisao Tsutsumi, Miyashiro; Kazumi Hori, Koganei, and Junichi Kawano, Sakura, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,847

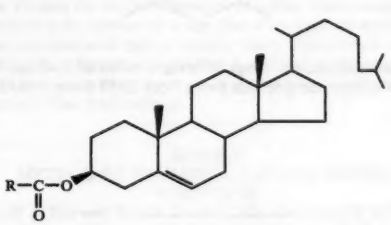
Claims priority, application Japan, Oct. 31, 1979, 54-139789

Int. Cl.³ A61K *7/00, 47/00;* **B01F** *17/30*

U.S. Cl. 424—365 **20 Claims**

1. A cosmetic composition which comprises 0.1 to 30% by weight of an emulsifier, a cosmetic oil component and water; wherein said emulsifier consists essentially of

a branched fatty acid cholesterol ester of the formula (I):

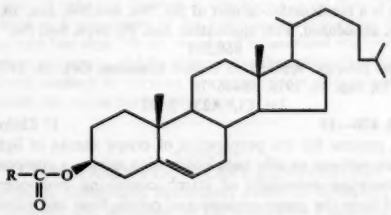


where R is a saturated aliphatic hydrocarbon group having a total of 11 to 23 carbon atoms and including at least one alkyl substituent group attached on the main chain inbetween the carboxyl-bonding position and the center of the main chain, and cholesterol:

wherein said branched fatty acid cholesterol ester and said cholesterol are in a weight ratio of 90:10 to 10:90.

12. An emulsifier composition consisting essentially of:

a branched fatty acid cholesterol ester of the formula (I)



where R is a saturated aliphatic hydrocarbon group having a total of 11 to 23 carbon atoms and including at least one alkyl substituent group attached on the main chain inbetween the carboxyl-bonding position and the center of the main chain, and

cholesterol;

wherein said branched fatty acid cholesterol ester and said cholesterol are in a weight ratio of 90:10 to 10:90.

4,348,416

FLAVORING WITH 1-ETHOXY-1-ETHANOL ACETATE - ACETALDEHYDE MIXTURES

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,137. This application Jul. 29, 1981, Ser. No. 287,935

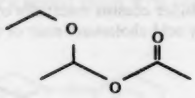
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.³ A23L *1/226, 1/235*

U.S. Cl. 426—3 15 Claims

9. A flavoring composition comprising an ingestibly acceptable carrier comprising a non-hygroscopic carbohydrate and a mixture of 1-ethoxy-1-ethanol acetate and acetaldehyde, the range of weight ratios of 1-ethoxy-1-ethanol acetate:acetaldehyde being from 50:50 down to 5:95, the acetaldehyde being present in excess of about 7% by weight based on the total weight of 1-ethoxy-1-ethanol acetate:acetaldehyde mixture, said carbohydrate and water.

13. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to foodstuff from 0.05 parts per million up to about 500 parts per million based on the total composition of a mixture of 1-ethoxy-1-ethanol acetate having the structure:



and acetaldehyde, the range of weight ratios of 1-ethoxy-1-ethanol acetate:acetaldehyde being from 50:50 down to 5:95.

4,348,417

POTATO SNACK AND PREPARATION THEREOF

Dirk H. Greup, Voorburg, and Willem Brouwer, Rijswijk, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Continuation of Ser. No. 732,777, Oct. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 696,504, Jun. 16, 1976, abandoned. This application Jan. 10, 1978, Ser. No. 868,303

Claims priority, application United Kingdom, Oct. 15, 1975, 42329/75; Sep. 16, 1976, 38446/76

Int. Cl.³ A23L *1/00*

U.S. Cl. 426—19 17 Claims

1. A process for the preparation of crispy snacks of light structure without an oily taste comprising mixing a composition consisting essentially of starch containing component selected from the group consisting of potato flour and potato starch, corn, buckwheat, tapioca, rice flour and soya meals and mixtures thereof, 5 to 20% by weight of an active yeast based on the starch containing component, water and 0.5 to 5% by weight of sugar fermentable by yeast based on the starch containing component and/or 20 to 100 ppm of an enzyme capable of forming such a sugar to form a dough mass, fermenting the dough mass for a period of time and temperature sufficient to form a light structure and frying the fermented dough to obtain a crispy snack of light structure.

4,348,418

SIMULATED FOOD PRODUCT AND METHOD OF MANUFACTURE THEREFOR

John R. Smith, Maidenhead, and Gerhard O. J. Fischer, Gerrards Cross, both of England, assignors to Quaker Oats Limited, Southall, England

Filed Jul. 24, 1980, Ser. No. 172,077

Claims priority, application United Kingdom, Aug. 1, 1979, 7926739; Sep. 19, 1979, 7932490

Int. Cl.³ A23L *1/04*

U.S. Cl. 426—104 14 Claims

1. A method of forming a food product in the form of shape-retaining pieces which comprises the steps of:

(a) producing an equeous slurry of comminuted food material having a water-soluble alginate salt dissolved therein,

(b) producing a slurry of a sparingly water-soluble calcium salt including as a retarding agent a member selected from the group consisting of sugar, a monohydric alcohol and a polyhydric alcohol,

(c) mixing the slurries of step (a) and (b) for a time period of less than 30 seconds,

(d) allowing the resulting mixture of step (c) to gel; and

(e) cutting into pieces the product of step (d), said water soluble alginate salt being present in an amount of from 0.3 to 5.0 percent by weight of said product.

4,348,419

METHOD FOR INHIBITING THE GROWTH OF *CLOSTRIDIUM BOTULINUM* AND THE FORMATION OF ENTEROTOXIN IN COMMINUTED MEAT PRODUCTS AND PRODUCTS THEREOF

John S. Thompson, Wayne, Pa., and Joseph F. Jadlocki, Jr., Mount Holly, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 184,689, Sep. 8, 1980, Pat. No. 4,277,507, which is a continuation-in-part of Ser. No. 140,328, Apr. 14, 1980, Pat. No. 4,282,260. This application Nov. 17, 1980, Ser. No. 207,566

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.³ A23B *4/02;* A23L *1/31*

U.S. Cl. 426—264 16 Claims

1. A comminuted meat product, which inhibits the growth of *Clostridium botulinum* and the production of enterotoxin during storage of said meat product, containing an alkali metal nitrite salt, in an amount less than about 120 ppm, and from about 1,000 ppm to about 3,000 ppm of a compound selected from the group consisting of hypophosphorous acid and non-toxic salts of hypophosphorous acid.

8. A method of inhibiting the production of enterotoxin from *Clostridium botulinum* and, upon cooking, inhibiting formation of nitrosamines from nitrite salt in comminuted meat products which comprises the step of adding thereto an alkali metal nitrite salt, in an amount less than about 120 ppm, and from about 1,000 ppm to about 3,000 ppm of a compound selected from the group consisting of hypophosphorous acid and non-toxic salts of hypophosphorous acid.

4,348,420

PROCESS FOR BINDING COMMINUTED MEAT

Cheryl J. Lynch, Midland Park, N.J.; Chifa F. Lin, Irvington, and Nicholas Melachouris, White Plains, both of N.Y., assignors to Nutrisearch Company, Cincinnati, Ohio

Filed Aug. 25, 1980, Ser. No. 181,253

Int. Cl.³ A23L *1/31*

U.S. Cl. 426—272 13 Claims

1. A process for binding comminuted meat comprising comminuting meat in the presence of a bindingly effective amount of a blend comprising from about 99.5% to about 50% of a water soluble dairy protein-containing material derived from lacteal fluid, and from about 0.5% to about 50% of a hydrocolloid, selected from the group consisting of algin, carrageenan,

guar, acacia, locust bean gum, carboxymethylcellulose and carboxymethyl starch, wherein said hydrocolloid is present in said comminuted meat in an amount ranging from about 0.01% to about 4% by weight based on the weight of the meat and binder blend before cooking.

4,348,421

PROCESS FOR RECONSTITUTING DEHYDRATED FOOD

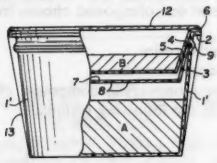
Sakuichi Sakakibara, Kobe; Ko Sugisawa, and Takashi Kimura, both of Nara, all of Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 97,692, Nov. 26, 1979, abandoned, which is a continuation of Ser. No. 746,474, Dec. 1, 1976, abandoned. This application May 21, 1981, Ser. No. 265,807

Claims priority, application Japan, Dec. 9, 1975, 50-165157; Dec. 9, 1975, 50-165158

Int. Cl.³ A23L *1/00*; B65D *81/32, 81/34*; B65B *29/06*

U.S. Cl. 426—394 **3 Claims**



1. A method of packaging and preparing at least two dehydrated food products comprising the steps of providing a lower tray-like container member having an imperforate bottom wall and having a first surrounding wall of a first height and a first upper surrounding rim at the top of the first surrounding wall thereby forming an open end of the lower container member, providing an intermediate tray-like container member having a perforated bottom wall and a second surrounding wall of a second height which is less than said first height and a second upper surrounding rim at the top of the second surrounding wall, providing an upper tray-like container member having an imperforate bottom wall and having a third surrounding wall of a third height which is less than said second height and a third upper surrounding rim at the top of the third surrounding wall thereby forming an open end of said upper tray-like container member, said third upper surrounding rim being a projecting rim, containing a first dehydrated food product in the lower container member, separately containing a second dehydrated food product in the upper container member, positioning the second surrounding wall of the intermediate container member inside the lower container member by contacting the second upper surrounding rim against the lower container member in the region of its open end such that the perforated bottom wall of the intermediate container member is supported above the first dehydrated food product in the lower container member, positioning the third surrounding wall of the upper container member inside the intermediate container member by contacting the third upper surrounding rim against one of the first and the second upper surrounding rims such that said bottom wall of said upper container member is supported in position above the perforated bottom wall and the first dehydrated food product, and enclosing at least said open end of said upper tray-like container member from the atmosphere with enclosing means and, when ready for reconstituting, removing said enclosing means, removing the upper container member including the second dehydrated food product from the position above the first dehydrated food product, applying hot water to the first dehydrated food product in the lower container member thereby reconstituting the first dehydrated food product, draining excess hot water from the first food product through the perforations in the bottom wall of the intermediate member, and separately applying hot water to the second dehydrated food product thereby reconstituting the second dehydrated food product.

4,348,422

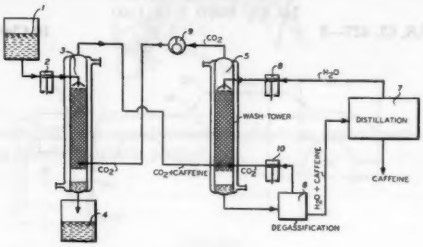
PROCESS FOR THE DIRECT DECAFFEINATION OF AQUEOUS COFFEE EXTRACT SOLUTIONS

Kurt Zosel, Oberhausen, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle m.b.H., Kaiser-Wilhelm-Platz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 877,535, Feb. 13, 1978, abandoned. This application May 17, 1978, Ser. No. 906,882

Int. Cl.³ A23F *5/22*

U.S. Cl. 426—475 **16 Claims**



1. Process for the decaffeination of coffee, which comprises contacting the surface of a thin film of an aqueous coffee extract solution with carbon dioxide under supercritical conditions of temperature and pressure to thereby remove the caffeine, and recovering the aqueous coffee extract solution substantially free from caffeine.

4,348,423

METHOD OF PREPARING A COCOA BUTTER SUBSTITUTE

David J. Pairaud; Sandro Musso; Catherine Bouvron nee Ferrenbach, and Xavier J. M. Pages-Xatart Pares, all of Abidjan, Ivory Coast, assignors to Biohorn, S.A., Abidjan, Ivory Coast

Filed Oct. 15, 1980, Ser. No. 197,128

Int. Cl.³ A23D *5/02*

U.S. Cl. 426—607 **7 Claims**

1. a method of preparing a cocoa butter substitute, comprising mixing fats consisting essentially of 35 to 45 parts by weight of a fat A having more than 40% by weight of C_{16} and C_{18} fatty acids and selected from the group consisting of shea butter, mango kernel fat, Borneo tallow (Shorea stenoptera, Pentadesma butyracea), sal (Shorea robusta), kokum (Garcinia indica) and mahua (Madhuca latifolia), with 65 to 55 parts by weight of palm oil fraction B containing more than 50% by weight of triglycerides of the palmitic-oleic-palmitine (POP) type and less than 1% by weight of trisaturated triglycerides, to form a mixture, and fractionating said mixture dissolved in a solvent medium by cooling to a temperature effective to precipitate the cocoa butter substitute.

4,348,424

SPRAYABLE PLANT CARE COMPOSITION

George A. Consolazio, Burlington; James A. Sheppard, Newburyport, and Benjamin E. Laramee, East Pepperell, all of Mass., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,083

Int. Cl.³ A01G *5/06*; C05B *17/00*

U.S. Cl. 427—4 **9 Claims**

1. A sprayable plant care composition comprising an emulsion containing: a continuous aqueous phase comprising gelatin hydrolysate, urea, dissolved phosphorus and potassium salts, and an amount of preservative effective to prevent microbial

growth in the composition; a dispersed phase comprising plant wax and a diluent for the wax; and an emulsifier in an amount effective to provide a stable emulsion and provide a cleaning action when the composition is applied to the foliage of a plant.

4,348,425

VARIABLE LOW-PRESSURE FLUID COLOR CHANGE CYCLE

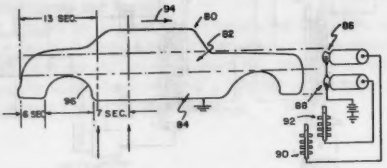
James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation-in-part of Ser. No. 228,166, Jan. 26, 1981, Pat. No. 4,311,724. This application Jun. 22, 1981, Ser. No. 275,872

The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.

Int. Cl.³ B05D *7/14, 1/00*

U.S. Cl. 427—8 **10 Claims**



1. A process for terminating the flow of a coating material in a coating material delivery tube which delivers the coating material to a dispensing device from which the material is dispensed during a coating operation and from which flow of the material ceases at the end of the coating operation including the steps of terminating the flow of coating material to the delivery tube before the end of the coating operation, and initiating the flow of a liquid medium at low superatmospheric pressure to the delivery tube to ensure continued delivery of coating material from the delivery tube to the dispensing device during the interval between shut-off of coating material flow to the delivery tube and the end of the coating operation.

4,348,426

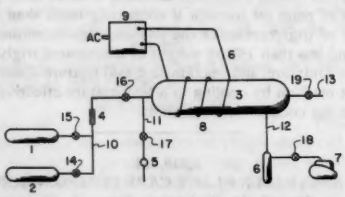
METHOD FOR BONDING SILICONE ELASTOMERS TO METAL SUBSTRATES

Donald R. Blenner, Erie; Robert A. Auerbach, Allison Park, and Herman V. Boenig, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Jun. 22, 1981, Ser. No. 276,216

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—41 **9 Claims**



1. A method for bonding vulcanizable silicone elastomer compositions to phosphatized metal substrates comprising:

(a) exposing to a first glow discharge plasma of a gaseous medium consisting essentially of at least one non-reactive gas at least one phosphatized metal element;

(b) applying over at least one plasma-exposed surface of said phosphatized metal element an adhesive composition suitable for bonding silicone elastomers to metal;

(c) contacting said adhesively-coated surface of said plasma-exposed phosphatized metal element with a vulcanizable silicone elastomer composition; and

(d) subjecting the resultant assembly to conditions sufficient to vulcanize said elastomer and cure said adhesive.

4,348,427

COATING METHOD AND COMPOSITION

Aldo Priola, and Giampaolo Giuliani, both of San Donato Milanese, Italy, assignors to ANIC, S.p.A., Palermo, Italy

Filed Jul. 11, 1980, Ser. No. 167,701

Claims priority, application Italy, Aug. 10, 1979, 25050 A/79

Int. Cl.³ B05D *3/06*

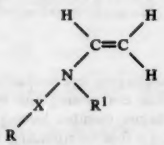
U.S. Cl. 427—44 **2 Claims**

1. A method for covering various surfaces consisting of applying to said surfaces a layer of material constituted by a mixture of at least one compound chosen from the following classes:

(a) epoxy-acrylic resins

(b) urethane-acrylate resins

and at least one monovinylic compound chosen from those corresponding to the following formula:



in which X can be —CO—, —SO_2— or

R can be a linear or branched aliphatic, alicyclic or unsubstituted aromatic alkyl group with 1 to 18 carbon atoms or can be equal to the group —NR^2_2; and R^1 and R^2 are groups analogous to R and can be equal to or different from it, R and R^1 also being able to be connected together to form a ring, in which case the number of atoms in the ring can vary from 6 to 14; and irradiating the previously obtained layer of material with radiations having a wavelength of between 200 and 400 nanometers, X-rays or electron beams.

4,348,428

METHOD OF DEPOSITING DOPED AMORPHOUS SEMICONDUCTOR ON A SUBSTRATE

Mark G. Rockley, and Gilbert J. Mains, both of Stillwater, Okla., assignors to Board of Regents for Oklahoma Agriculture and Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Sciences, Stillwater, Okla.

Filed Dec. 15, 1980, Ser. No. 216,087

Int. Cl.³ C23C *17/02*

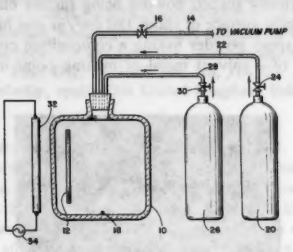
U.S. Cl. 427—54.1 **11 Claims**

1. A method of depositing a doped amorphous semiconductor on a base member comprising the steps of:

(a) subjecting the base member to an environment including

(1) a semiconductor gas selected from silane and germane,

(2) a dopant gas selected from arsine, phosphine and diborane, and (3) mercury vapor; and



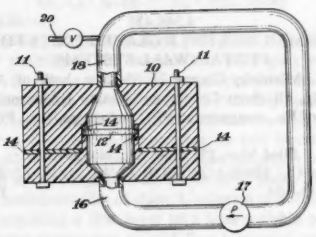
(b) exposing the base member in the environment to ultraviolet radiation to effect mercury photosensitized decomposition of semiconductor and dopant onto the member.

4,348,429

PROCESS FOR SILVER COATING OF PERMEABLE SUBSTRATES

James A. McIntyre; Robert F. Phillips, both of Midland, and Joseph D. Lefevre, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1978, Ser. No. 939,589
Int. Cl.³ B05D *5/12*; C23C *3/02*
U.S. Cl. 427—125 **9 Claims**



1. A process for the electroless deposition of a known amount of silver onto a porous substrate wherein an aqueous electroless plating solution containing a reducible silver compound is circulated and recirculated through the porous substrate until the silver content of the solution is substantially exhausted, the circulation of the plating solution being in a direction which forces upwardly hydrogen evolved in the silver deposition reaction.

4,348,430

PROCESS FOR PRODUCING MAGNETIC PARTICLES FOR MAGNETIC RECORDING MEDIUM

Yasumichi Tokuoka, and Takayoshi Kobuke, both of Tokyo, Japan, assignors to TDK Electronics Company, Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,801
Claims priority, application Japan, Jan. 19, 1980, 55-5015
Int. Cl.³ B05D *7/00*
U.S. Cl. 427—215 **4 Claims**

1. A process for producing magnetic particles for a magnetic recording medium, comprising: (a) preparing particles of goethite seed crystals; (b) precipitating a layer of goethite on said seed crystals and simultaneously precipitating silicate ions on said crystals with the precipitating goethite material; and (c)

heat treating the coated particles to obtain the desired particulate metallic magnetic product.

4,348,431

PROCESS FOR COATING PLASTIC FILMS

William J. O'Malley, Killington, Vt., assignor to General Electric Company, New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,901
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—387 **14 Claims**

1. A method for coating plastic films which comprises the steps of

(i) applying to a moving web of said plastic film an aqueous composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water-solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition including a small, catalytic amount of a buffered latent silanol condensation catalyst and a minor proportion, sufficient to promote flow, of a β-hydroxyketone compound; and

(ii) transporting said film into a zone of elevated temperature sufficient to effect substantially complete cure of the silanol in less than about 120 seconds.

4,348,432

METHOD FOR COATING WITH RADIALLY-PROPAGATING, FREE, LIQUID SHEETS

John C. Huang, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 8, 1976, Ser. No. 675,068
Int. Cl.³ B05D *1/36, 7/00*
U.S. Cl. 427—402 **4 Claims**

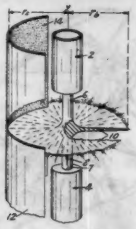
1. A method for coating a liquid on a substrate comprising

(a) providing at least one liquid jet issuing from a nozzle means in laminar flow,

(b) impinging said jet on a deflecting mass to form a continuous, radially-propagating, free, composite liquid sheet comprising a plurality of distinct layers in a laminar flow mode and

(c) moving a sheet-like substrate to be coated relative to the

plane of said liquid sheet so as to intercept at least a portion of said liquid sheet within the periphery, thereby



causing said liquid to impinge on said substrate and to coat one surface of said substrate.

4,348,433

FLAME SPRAY POWDER

Paul A. Kammer, Cold Spring Harbor, and George J. Durmann, Farmingdale, both of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.

Filed Apr. 6, 1981, Ser. No. 250,932
Int. Cl.³ B05D 1/10
U.S. Cl. 427—423 **24 Claims**

1. A free-flowing self-bondable flame spray powder derived from an atomized alloy powder, said powder having particles characterized by aspherical shapes and having an average particle size within the range of about plus 400 mesh to minus 100 mesh,

said aspherically shaped powder being further characterized by a specific surface of about 180 cm^2/gr and higher,

said flame spray powder having a composition consisting essentially of a solvent metal alloy selected from the iron-group base alloys consisting of nickel-base, iron-base, and cobalt-base alloys contaning by weight about 5% to 35% chromium, said solvent metal alloy having a negative free energy of oxidation ranging up to about 80,000 calories per gram atom of oxygen referred to 25° and being pre-alloyed with about 5% to 15% by weight of a highly oxidizable solute metal whose negative free energy of oxidation is at least about 100,000 calories per gram atom of oxygen referred to 25° C.

4,348,434

FLAME SPRAY POWDER

Paul A. Kammer, Cold Spring Harbor; George Yurasko, Jr., Glen Cove, and Karel Zmrzlik, New York, all of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,331
Int. Cl.³ B05D 1/10
U.S. Cl. 427—423 **12 Claims**

1. A free-flowing self-bondable flame spray powder derived from an atomized alloy, said powder having particles characterized by aspherical shapes and having an average particle size within the range of about plus 400 mesh to minus 100 mesh,

said aspherically shaped powder being further characterized by a specific surface of about 180 cm^2/gr and higher,

said flame spray powder having a composition consisting essentially of a solvent metal of melting point in excess of

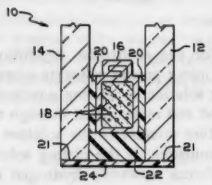
about 1100° C. whose negative free energy of oxidation ranges up to about 80,000 calories per gram atom of oxygen referred to 25° C. and being pre-alloyed with at least one highly oxidizable solute metal in an amount of at least about 3% by weight, said oxidizable metal having a negative free energy of oxidation of at least about 100,000 calories per gram atom of oxygen referred to 25° C.

4,348,435

PRIMED MULTIPLE GLAZED UNITS FOR CURTAINWALL SYSTEMS

George R. Mistrick; George H. Bowser, both of Allegheny Township, Allegheny County, and Renato J. Mazzoni, Creighton, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 19, 1980, Ser. No. 131,581
Int. Cl.³ E06B 3/24; B32B 17/10, 25/18, 27/30
U.S. Cl. 428—34 **15 Claims**



1. A multiple glazed unit having a pair of sheets, means for spacing said sheets from one another to provide a space therebetween, and means for sealing said space, said sealing means including an organic elastomer having an exposed surface which is to be adhered to a structural member through the interposition and curing of a silicone elastomer adhesive, wherein the improvement comprises:

a layer of a primer dried on at least said exposed surface of said organic elastomer, the primer selected to improve adhesion between said organic elastomer and said interposed and cured silicone elastomer adhesive, wherein the primer is a material selected from the group consisting of acrylic latex polymers, acrylic emulsion polymers, ethylene copolymers, and hydrocarbon resin emulsion polymers.

4,348,436

ENCLOSURE MEMBER SUBSTANTIALLY IMPERMEABLE TO THE TRANSMISSION OF SOLVENTS AND FUELS

Roger A. Shefford, Aldershot, England, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Dec. 10, 1980, Ser. No. 214,623

Claims priority, application United Kingdom, Feb. 12, 1980, 8004570

Int. Cl.³ B65D *1/00;* B05B *5/02*

U.S. Cl. 428—35 8 Claims

1. An enclosure member substantially impermeable to the transmission of solvents and fuels consisting essentially of solid polyolefins that have a linear carbon to carbon backbone structure and have a plurality of free hydrogen atoms attached to the carbon atoms with a permeability to wet solvents and fuels of less than 1/7 of the permeability of untreated enclosure members having a thickness of 1 mm, the enclosure having an inner and outer surface, at least the inner surface having a portion of the hydrogen atoms replaced by sulfonic or sulfonate groups and being subjected to a treatment with an aqueous solution comprising ferrous sulfate and phenanthroline, both in a concentration of at least 0.05 weight % at 20° C., at which at least a part of the cations of said surface has been replaced by said iron-phenanthroline complex.

4,348,437

PUNCTURE-RESISTANT HEAT SHRINKABLE MULTILAYER PACKAGING FILM

Stanley Lustig, Park Forest, and Stephen J. Vicik, Darien, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 10, 1981, Ser. No. 272,259

Int. Cl.³ B32B *27/40;* C08G *18/42*

U.S. Cl. 428—35 14 Claims

1. A flexible puncture-resistant, heat shrinkable and biaxially stretched multilayer film suitable for packaging primal red meat cuts, including a layer having a thickness of at least about 0.5 mil comprising a blend of polyurethane polymer and an ethylene vinyl acetate copolymer, wherein the weight fraction of ethylene vinyl acetate copolymer in said blend does not exceed 0.40, with said film having been subjected to a biaxial stretching in the range of from about 12 to about 20.

7. The multilayer film of claim 1, wherein said film has three layers comprising a first layer of a heat sealable polymer; a second layer contiguous to said first layer and providing a barrier to oxygen permeation through the film and a third layer contiguous to said second layer and comprising a blend of a polyurethane polymer and an ethylene vinyl acetate copolymer.

8. A primal meat bag formed from the three layer film of claim 1.

4,348,438

PROCESS FOR PREPARATION OF IMPROVED SHRINK WRAP

Peter J. Canterino, Towaco, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,711

Int. Cl.³ B32B *27/00;* B29D *23/10*

U.S. Cl. 428—36 4 Claims

1. A process for preparing a low density polymer shrink wrap which comprises, forming a low density polyethylene film, uniaxially orienting said film at a temperature of between 5° and 70° C. below the melting point of said polymer, irradiating said film with a source of ionizing irradiation, at a dosage of from about 3 to about 15 megarads, forming the film into a sleeve-like article-encompassing enclosure by cutting and sealing said film along a seam which runs generally perpendicular to the direction of said uniaxial orientation in the plane of said film.

4,348,439

PACKAGE OF WOUND STRAND MATERIAL

Otto G. Jones, Burkburnett, Tex., assignor to Certain-teed Corporation, Valley Forge, Pa.

Filed Feb. 18, 1981, Ser. No. 235,518

Int. Cl.³ B32B *1/08;* B65H *55/02*

U.S. Cl. 428—36 39 Claims

1. A package comprising a strand of filaments or fibers coiled in layers into a generally tubular configuration having a generally cylindrical outer surface and a sheet material extending around said cylindrical outer surface, said sheet material being an ionic copolymer of α-olefins having the formula $R\text{-}CH{=}CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and α,β-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, said copolymers having from 10% to 90% of the carboxylic acid groups ionized by neutralization with metal ions uniformly distributed throughout the copolymer, said copolymer being a direct copolymer of the α-olefins and the unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which (1) the α-olefin content of the copolymer is at least 50 mol percent, based on the α-olefin-acid copolymer, (2) the unsaturated carboxylic acid content of the copolymer is from 0.2 to 25 mol percent, based on the α-olefin-acid copolymer, and (3) any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated, and said metal ions having an ionized valence of from one to three inclusive when the unsaturated acid is a mono-carboxylic acid and an ionized valence of one when the unsaturated acid is a dicarboxylic acid and said metal ions being selected from the group consisting of uncomplexed and complexed metal ions, said ionic copolymers having solid state properties characteristic of crosslinked polymers and melt-fabricability properties characteristic of uncrosslinked, thermoplastic polymers, wherein the cylindrical outer strand portions at the interface with said sheet material and said sheet material comprise means for holding an induced electrostatic charge and remaining in electrostatic co-attracting relation to each other an amount sufficient to hold otherwise unsupported strand coils against the sheet material without coil collapse upon unwinding of the strand.

4,348,440

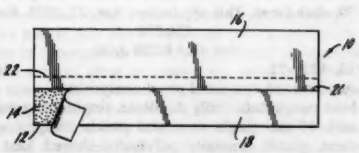
PRESSURE SENSITIVE SEAL

Richard A. Kriozere, Highland Park, Ill., assignor to Professional Tape Company, Inc., Burr Ridge, Ill.

Filed Mar. 29, 1979, Ser. No. 25,282

Int. Cl.³ B32B *7/06, 7/12*

U.S. Cl. 428—41 2 Claims



1. A pressure sensitive seal member for providing a complete

adhesive-to-adhesive seal for the open end of a pouch including a strip of face stock having a pressure sensitive adhesive covering one face thereof, removable backing strips covering said adhesive face and being in edge contact along a generally longitudinal line, said face stock having a generally longitudinal fold perforation which is offset from the generally longitudinal edge contact line, said fold perforation being covered by one of said backing strips,

when said seal member is applied, first the other of said backing strips is removed so that said fold perforation remains covered, one side of the pouch open end is applied to the exposed adhesive face, subsequently, the other backing strip is removed, exposing the fold perforation, the face stock is then folded at the fold perforation and that portion of the formerly covered adhesive face on the opposite side of the fold perforation is applied to the other side of the pouch open end whereby the open ends of the pouch each have an adhesive seal with the face stock and directly adjacent and along the pouch open end there is adhesive-to-adhesive contact between folded areas of the face stock, said strip having a length slightly greater than the open end of the pouch whereby there is also adhesive-to-adhesive contact between folded portions of the face stock at opposite sides of the pouch open end.

4,348,441

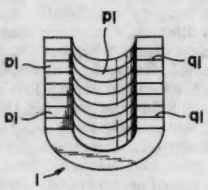
FIBROUS INSULATING MATERIAL AND INSULATING WALL

Takeo Kato, Toyokawa, Japan, assignor to Isolite Babcock Refractories Co., Ltd., Aichi, Japan

Continuation of Ser. No. 1,386, Jan. 5, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 187,762

Int. Cl.³ C04B 43/02

U.S. Cl. 428—49 **11 Claims**



1. A furnace wall construction comprising a furnace wall and a fibrous insulation bonded thereto consisting of an insulating material obtained by stacking ceramic fiber blankets in the thickness direction and bonding together contact surfaces of adjacent fiber blankets by applying adhesive layers to at least one surface of said material, said adhesive being gasified and burnt away at the operating temperature of the furnace, said fibrous insulating material being thereafter bonded to said furnace wall.

4,348,442

STRUCTURAL PANEL

Irving E. Figge, 2174 E. Pepperwood Dr., Sandy, Utah 84070

Continuation-in-part of Ser. No. 172,674, Jul. 28, 1980, abandoned, which is a continuation of Ser. No. 45,918, Aug. 17, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,630

Int. Cl.³ B32B 3/30

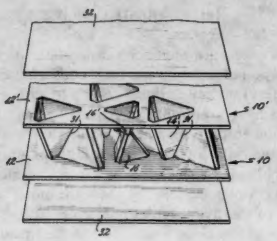
U.S. Cl. 428—72 **10 Claims**

1. A combined structural panel comprising:

at least two, substantially duplicate, single structural panels, each of said single structural panels comprising a base sheet, plural generally polyhedral-shaped load bearing elements protruding from said base sheet;

each of said elements comprising a base attached to said base sheet, a truncated apex, and face structure connecting said base and said truncated apex;

at least one of said single panels inverted with respect to at least one other of said single panels to define respective, opposing top and bottom panels, respectively, such that the elements of said top and bottom panels have their respective elements protruding in opposite directions;



said elements of each single panel further comprising large and small elements, said large elements having a base-to-truncated apex height greater than that of said small elements, said large and small elements of each of said top and bottom panels alternately arranged such that truncated apexes of said small elements of opposing single panels abut and truncated apexes of said large elements of a single panel abut the base of the opposing single panel.

4,348,443

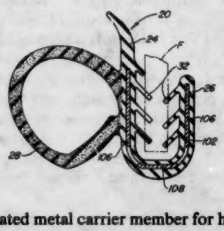
RESILIENT STRIP AND METAL CARRIER THEREFOR

Richard D. Hein, Wabash, Ind., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Dec. 18, 1980, Ser. No. 217,737

Int. Cl.³ E06B 7/18

U.S. Cl. 428—122 **6 Claims**



1. An elongated metal carrier member for holding the legs of an elongated resilient channel-shaped strip pressed against opposite sides of a rigid flange, said carrier member having a channel-shaped cross section with a continuous, longitudinally extending web and a plurality of sheet metal elements extending laterally from both sides of said web and bent to form the legs of said channel-shaped cross-section, said sheet metal elements having distal end portions facing in the same direction away from said web, each of said sheet metal elements having the property of reacting to being outwardly displaced by said rigid flange by exerting a gripping spring force inwardly toward said rigid flange, said carrier member having the improvement characterized by:

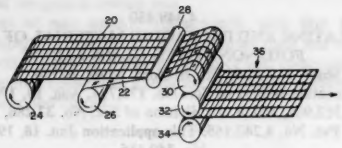
each of said sheet metal elements of said carrier member being relatively wide at the junctures of the elements with said web, and relatively narrow at said distal end portions, and having side edges that extend from said web and converge toward each other in the direction of said distal end portions.

4,348,444

NONWOVEN FABRIC FROM A COMBINATION OF THERMOPLASTIC NETTING AND ORIENTED FILM

Alan D. Craig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 8, 1981, Ser. No. 299,710
Int. Cl.³ B32B 5/12
U.S. Cl. 428—137 **13 Claims**



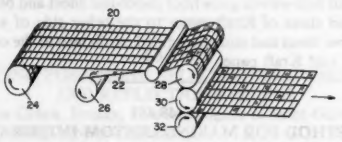
1. A thermoplastic reticulate open netting structure with high sewn seam strength comprising:
a first layer of oriented polypropylene netting,
a second layer consisting essentially of a random copolymer having between about 7% and about 30% 1-butene and between about 93% and 70% propylene, said copolymer having an intrinsic viscosity of between about 1.1 and 4.0,
said first and second layers being bonded together to form an open netting structure.

4,348,445

REINFORCED FILM OF A COMBINATION OF THERMOPLASTIC NETTING AND ORIENTED FILM

Alan D. Craig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 8, 1981, Ser. No. 299,753
Int. Cl.³ B32B 5/12
U.S. Cl. 428—138 **11 Claims**



1. A tear resistant reinforced film comprising:
a first layer of oriented polypropylene netting,
a second layer of random copolymer film consisting essentially of a copolymer having between about 7% to 30% of 1-butene and between about 93% to 70% of propylene, the copolymer of said film having an intrinsic viscosity of between about 1.1 and 4.0,
said first and second layers being bonded together to form a reinforced film.

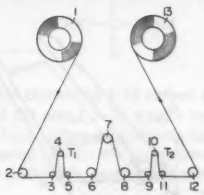
4,348,446

POLYESTER FILM HAVING IMPROVED SLIPPERINESS

Yukio Mitsuishi; Shigeru Shiozaki, both of Machida; Takao Chujo, Sagamihara, and Takeyuki Yokoyama, Fujisawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 882,467, Mar. 1, 1978, abandoned. This application Sep. 4, 1980, Ser. No. 183,901
Claims priority, application Japan, Mar. 1, 1977, 52-20892; Nov. 24, 1977, 52-139870
Int. Cl.³ G11B 5/70
U.S. Cl. 428—148 **15 Claims**

1. A magnetic recording tape comprising a substrate with a magnetic coating thereon, said magnetic recording tape having good transportability and high abrasion resistance and being free of a back lubricant layer, said substrate consisting of a biaxially oriented polyester film having a kinetic friction coefficient at a tape speed of 25 cm/sec in the range from 0.05 to 0.25, and having at least one rough surface with protrusions integrated thereto, said protrusions having a maximum size of 1 micron in height and having an average peak-to-valley height of not more than about 0.55 micron and being originated from an insoluble inert substance having a representative particle diameter of not more than 0.55 micron incorporated into said polyester in an amount ranging from 0.08 to 2% by weight, wherein the height denoted by h (micron) in the range $1.0 \geqq h > 0.75$, is not more than $14/mm^2$, $0.75 \geqq h > 0.5$, is from 5 to $150/mm^2$, and $0.5 \geqq h$, is not less than $40/mm^2$, and wherein the insoluble inert substance consists essentially of not more than 8% by weight of a fraction having particle diameters, expressed as d in microns, $2.5 \geqq d > 1.5$ and from 40 to 80% by weight of a fraction of $0.5 \geqq d$, said film having an abrasion resistance grade of at least 2 when transported at a speed of 25 cm/sec at 25° C. and 60% relative humidity with said rough surface in contact with an SUS 27 stationary rod wrapped with tissue paper having a surface roughness of 0.35, an outer diameter of 20 mm ϕ with a wrapping arc angle of $\theta = (152/180)\ \pi$ radius (152°), said abrasion resistance grade being defined as follows:



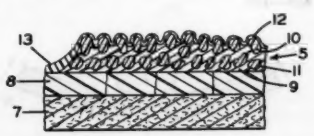
Grade 1: free from white powder;
Grade 2: a small amount of white powder;
Grade 3: white powder speckled all over the tissue paper;
Grade 4: white powder more than Grade 3;
Grade 5: white powder covering the whole surface of the tissue paper.

4,348,447

NON-SKID PLASTIC FLOORING PRODUCT AND METHOD OF MANUFACTURE

Jesse D. Miller, Jr., and James R. Petzold, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Feb. 24, 1981, Ser. No. 237,666
Int. Cl.³ B32B 5/16, 3/26
U.S. Cl. 428—149 **6 Claims**



1. A non-skid decorative plastic floor covering comprising a decorative plastic base having a plastic matrix applied thereto, a plurality of slip-resistant elements positioned throughout the matrix and a cured clear or translucent wear layer overlying both the slip-resistant elements and the plastic matrix, a plastic matrix being applied to said base, said slip-resistant elements comprising round particles of quartz having a Moh hardness of about 7 and a particle size distribution such that none are greater than about 715 microns, about 80% are between about 300 and 595 microns and none are smaller than 150 microns,

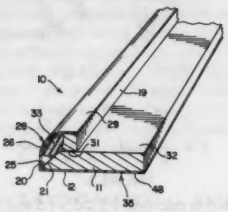
said particles being embedded in the cured plastic matrix and being distributed throughout the plastic matrix in a substantially abutting relationship with the upper most layer of particles protruding above the matrix and thus imparting a rough textured non-skid surface to the overlying wear layer.

4,348,448

MOLDING STRIP HAVING A CURVILINEAR SURFACE AND A METHOD FOR MAKING SAME FROM LAMINAR SHEET MATERIAL

Richard R. Cornell, 334 W. State St., Newcomerstown, Ohio 43832

Filed Sep. 8, 1981, Ser. No. 299,852
Int. Cl.³ B32B *3/04, 3/12, 3/26*
U.S. Cl. 428—157 **7 Claims**



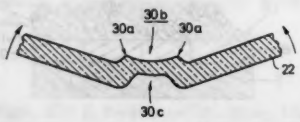
7. A molding strip comprising:
a strip of sheet material in the form of a substrate and a laminar facing secured to the substrate;
a groove in the substrate, said groove having spaced side walls with the laminar facing spanning between said side walls;
said span of laminar facing defining a surface of curvilinear disposition; and,
at least a portion of the laminar facing defining the curvilinear surface being supported and maintained by a foamed plastic material.

4,348,449

PROCESS AND APPARATUS FOR FORMING FLEXIBLE FOLD LINES IN THERMOPLASTIC SHEETS

Gerhard Seufert, Rembrücken, Fed. Rep. of Germany, assignor to Melvin Bernard Herrin, Meadowbrook, Pa.

Division of Ser. No. 830,536, Sep. 6, 1977, Pat. No. 4,179,252, which is a division of Ser. No. 653,053, Jan. 28, 1976, Pat. No. 4,064,206. This application Jul. 9, 1979, Ser. No. 55,736
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541345
Int. Cl.³ B32B *3/30*
U.S. Cl. 428—167 **8 Claims**



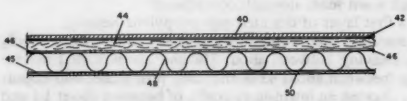
1. A blank comprising a single layer of a sheet material of predetermined thickness composed of a substantially plasticizer-free thermoplastic polymer and having parallel fold lines formed therein, each of said fold lines being substantially free of spring-back resilience when the sheet material on one side of a fold line is folded along said fold line at an angle with respect to the sheet material on the other side of said fold line, each of said fold lines having a rounded configuration extending into one surface of said sheet material and out of the other surface of said sheet material, whereby said fold lines are offset as compared to the plane of said sheet material prior to said sheet material being folded along a fold line, the thickness of said sheet material at said fold lines being about 30–60% of the predetermined thickness of said sheet material, there being a bulge on said other side of said sheet material on opposite sides of each of said fold lines along the length thereof, said bulges being produced by polymer within said sheet material being forced sideways during the formation of said fold lines.

4,348,450

INSULATING AND PACKAGING MATERIAL OF METAL FOIL-NONWOVEN GLASS FABRIC

Julius Shaw, 259 Field St., Bedford, Mass. 02740

Continuation-in-part of Ser. No. 178,794, Aug. 18, 1980, Pat. No. 4,312,909, which is a division of Ser. No. 32,286, Apr. 23, 1979, Pat. No. 4,242,165. This application Jan. 18, 1982, Ser. No. 340,116
Int. Cl.³ B32B *17/10*
U.S. Cl. 428—182 **4 Claims**



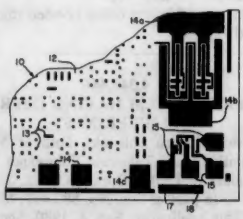
3. A laminate for use as packaging material comprising:
a metal foil sheet such as aluminum foil, having a thickness of between 0.0007–0.005 in.;
a non-woven glass fiber paper-like sheet having a thickness of between 0.010–0.500 in.;
a sheet of Kraft paper of a weight between 30–90 lbs;
a sheet of corrugated cardboard of either single or double-wall type; and
a plasticized ethylene vinyl acetate co-polymer emulsion-type adhesive bonding said metal foil sheet to one side of said non-woven glass fiber paper-like sheet and one side of said sheet of Kraft paper to the other side of said glass fiber sheet and said corrugated cardboard to the other side of said Kraft paper.

4,348,451

METHOD FOR MAKING CUSTOM INTEGRATED CIRCUITS AND METALLIZATION ARTWORK THEREFOR

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 6, 1981, Ser. No. 261,066
Int. Cl.³ B32B *3/00;* **B05D** *5/12;* **B32B** *15/04;* **H01L** *27/02*
U.S. Cl. 428—203 **2 Claims**



1. Artwork for making a metallizing mask by which a metal film system for contacting the components of a custom integrated circuit may be made by standard metallization photolithographic and selective etch processes comprising:
a transparent sheet;
separate patches of an opaque cut-and-strip type film ad-

hered to said sheet, one group of said separate patches being at locations, respectively, corresponding to contact areas of said components, another group of said separate patches corresponding to terminal pads for said integrated circuit;

opaque strips adhered to said sheet, said strips overlapping and connecting said patches to effect the necessary interconnection between said components and terminal pads and thus to form a functional principal circuit portion of said integrated circuit; and

islands of said opaque cut-and-strip type film that are adapted to completely form terminal pads and interconnecting metal to a special group of said components that together constitutes a separate test circuit portion of said integrated circuit.

4,348,452

PREFABRICATED SELF-SUPPORTING PANELS AND ITS MANUFACTURING PROCESS

Peccenini Paolo, Villagrappa, and Romini Paolo, Ravenna, both of Italy, assignors to Pantec S.R.L., Forli, Italy

Continuation-in-part of Ser. No. 57,203, Jul. 13, 1979, Pat. No. 4,268,574. This application Mar. 11, 1981, Ser. No. 242,647
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.³ B32B *5/18, 5/22*
U.S. Cl. 428—312.6 **12 Claims**

1. A prefabricated self-supporting panel comprising two outer layers and at least one inner layer, said at least inner layer consisting of a foamed mixture consisting of:

(a) a foamed unsaturated polyester resin,

(b) an organo-functional silane derivative in a proportion of 0.1% to 5 percent,

(c) a granular filler formed of foamed clay having an average diameter between 15 and 20 mm and a specific gravity of 0.35 Kg/dm³ in such a quantity as to fill the whole cavity between the two outer layers.

4,348,453

GLAZING POSSESSING SELECTIVE TRANSMISSION AND REFLECTION SPECTRA

Sabatino Cohen, Sceaux, France, assignor to Saint-Gobain Vitrage, Neuilly-sur-Seine, France

Filed Mar. 30, 1981, Ser. No. 248,895
Claims priority, application France, Mar. 28, 1980, 80 06973
Int. Cl.³ B32B *15/04, 17/06*
U.S. Cl. 428—333 **10 Claims**

1. Glass having selective transmission and reflection spectra comprising a transparent substrate on which a reflective layer consisting of a metal or alloy is deposited in which the reflective layer is coated with a protective layer of mixed cadmium and tin oxide.

4,348,454

ULTRAVIOLET LIGHT CURABLE ACRYLIC FUNCTIONAL SILICONE COMPOSITIONS

Richard P. Eckberg, Round Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,297
Int. Cl.³ C08G *77/20;* **B32B** *27/16*
U.S. Cl. 428—334 **17 Claims**

1. An acrylic functional polyorganosiloxane composition comprising: the reaction product of (A) an omega-haloalkene; (B) a dialkylhydrogen chainstopped polydialkylalkylhydrogensiloxane copolymer; (C) an amount of precious metal catalyst effective for catalyzing a hydrosilation reaction between said alkene and said siloxane copolymer; and (D) an acrylic functional monomer.

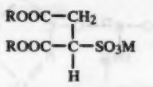
4,348,455

THERMOPLASTIC FOOD WRAPPING FILM HAVING IMPROVED CLING

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,496
Int. Cl.³ B32B *27/00;* **B05D** *5/10*
U.S. Cl. 428—336 **19 Claims**

1. A transparent, flexible, thermoplastic, food wrap film having improved shear strength cling, said film comprising having a coating on at least one surface thereof of a composition comprising (a) about 80–95 weight percent of at least one alkali metal dialkyl sulfosuccinate of the formula:



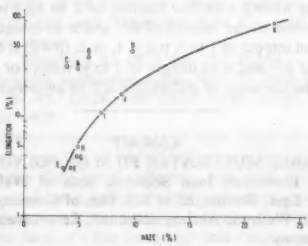
wherein R is alkyl containing 4–18 carbon atoms and M is an alkali metal and (b) about 5–20 weight percent of a lower alcohol soluble high boiling moisturizing liquid selected from the group consisting of dihydric alcohols, trihydric alcohols, higher polyhydric alcohols, esters of adipic acid and esters of phthalic acid.

4,348,456

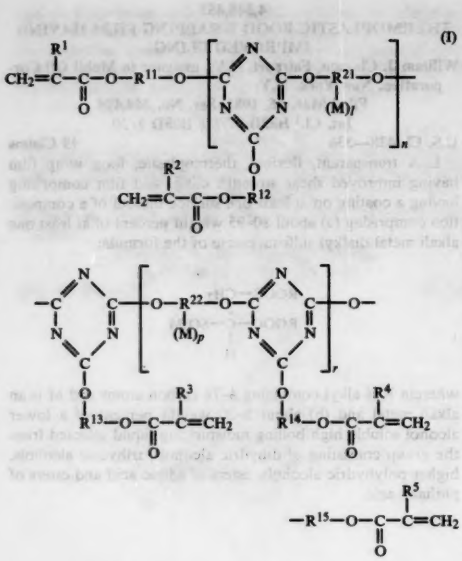
ABRASION-RESISTANT LAMINATED FILM

Yoshihiko Imanaka; Yoichi Saito, both of Hino, and Akihiro Horike, Musashino, all of Japan, assignors to Teijin Limited, Osaka, Japan

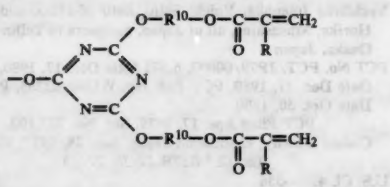
PCT No. PCT/JP79/00097, § 371 Date Dec. 17, 1980, § 102(e) Date Dec. 17, 1980, PCT Pub. No. WO80/02255, PCT Pub. Date Oct. 30, 1980
PCT Filed Apr. 17, 1979, Ser. No. 227,102
Claims priority, application Japan, Sep. 28, 1977, 52-115509
Int. Cl.³ B32B *27/30, 27/36*
U.S. Cl. 428—336 **6 Claims**



1. A thermoplastic resin film laminate composed of a flexible thermoplastic resin film having a thickness of not more than 500 microns coated or laminated, on one or both sides thereof, with a high elongation and abrasion resistant vinyl polymer layer, which layer has a thickness of 0.5 to 1.5 microns and is composed mainly of a polymerized cyanurate ring-containing (meth)acrylate represented by the general formula (I) wherein the cyanurate ring-containing (meth) acrylate contains essentially not more than 1 weight percent of chlorine atoms



wherein R^1, R^2, R^3, R^4, and R^5 each represents a hydrogen atom or a methyl group; R^{11}, R^{12}, R^{13}, R^{14}, and R^{15} each represents an alkylene group having a carbon number of 2 to 4; R^{21} and R^{22} each represents a 2–4 valent saturated hydrocarbon group having a carbon number of 2 to 6, wherein a part of the carbon atoms may be replaced by oxygen atoms forming ether linkages; M is —OH and/or a group



(wherein R is hydrogen atom or methyl group; R^{10} is an alkylene group having a carbon number of 2 to 4); l is 0, 1 or 2; (l+2) is equal to the valence of R^{21} and is an integer of 2 to 4; n is 0 or an integer of 1 to 3; p is 0, 1, or 2; (p+2) is equal to the valence of R^{22} and is an integer of 2 to 4; when l or p is 2, both Ms may be the same or different; r is 0 or an integer of 1 to 3.

4,348,457

SEALABLE MULTILAYER FILM OF POLYOLEFINS

Heinrich Rosenthal; Ingo Schinkel, both of Walsrode, and Günter Eger, Bomlitz, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,604

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941909

Int. Cl.³ B32B *27/32, 31/16*

U.S. Cl. 428—349 **10 Claims**

1. A multilayer film comprising a polypropylene layer and at least one heat sealable layer comprising polyethylene or an ethylene copolymer containing at least 4% by weight of ethylene, the heat sealable layer containing an additive combination comprising:

(1) from 0.3 to 1% by weight, based on the sealable layer, of a long-chain aliphatic amine;

(2) from 0.1 to 0.7% by weight, based on the sealable layer, of dispersed thermoplastic polymer which is incompatible with the polyethylene or ethylene copolymer and which has a softening range which is not more than either 50° C. below or 50° C. above the softening point of the polyethylene or ethylene copolymer; and

(3) from 0.3 to 0.8% by weight, based on the sealable layer, of a polydialkyl siloxane.

4,348,458

COILED INORGANIC MONOLITHIC HOLLOW FIBERS

Roger S. Otstot, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 8, 1980, Ser. No. 184,878

Int. Cl.³ D02G *3/00;* B32B *9/00*

U.S. Cl. 428—366 **17 Claims**

1. An essentially inorganic brittle monolithic hollow fiber having an anisotropic internal void volume wall structure, wherein the hollow fiber has at least one segment self-supportingly disposed as a coil.

4,348,459

THERMOPLASTIC ELASTOMER AND ELECTRICAL ARTICLE INSULATED THEREWITH

Robert S. Drzal, Naugatuck, and Charles D. Shedd, Waterbury, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,226

Int. Cl.³ B32B *15/00, 15/08;* C08K *5/01*

U.S. Cl. 428—379 **9 Claims**

1. An electrical plug or connector made from a composition comprising

(a) ethylene-propylene non-conjugated diene terpolymer rubber having an ethylene content of from 70 to 85 percent by weight and a gel content of from 10 to 45% by weight measured in cyclohexane at room temperature;

(b) an essentially crystalline propylene polymer;

(c) a naphthenic or paraffinic extender oil; and

(d) an inorganic filler suitable to absorb at least a portion of said extender oil (c);

wherein the weight ratio of (a)/(b) is from 90/10 to 25/75, the concentration of (c) is from 20 to 100 parts per 100 parts by weight of (a) plus (b), the concentration of (d) is from 10 to 100 parts per 100 parts by weight of (a) plus (b), and the weight ratio of (c)/(d) does not exceed 2.5/1; said composition having a flexural modulus of from 6,000 to 15,000 psi and an extrusion value of from 80 to 180 pounds measured by capillary rheometer.

4,348,460

POWER INSERTABLE POLYAMIDE-IMIDE COATED MAGNET WIRE

Hollis S. Saunders; Richard V. Carmer, and Lionel J. Payette, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

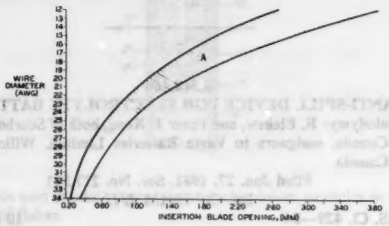
Filed Oct. 19, 1981, Ser. No. 312,215

Int. Cl.³ B32B *27/00;* H01B *7/00*

U.S. Cl. 428—383 **9 Claims**

1. A lubricated magnet wire comprising an electrically conducting substrate having an electrically insulating polyamide-

imide outer coating, and an external lubricant coating on the polyamide-imide outer coating comprising a mixture of paraffin wax, hydrogenated triglyceride and an ester lubricant composition comprising esters of fatty alcohols and fatty acids, the



ratio by weight, of paraffin wax to triglyceride being approximately 1:15 to 60:1, and the ratio of triglyceride to ester lubricant being approximately 1:30 to 30:1, the coated magnet wire capable of power insertion into coil slots in its locking wire size range.

4,348,461

RECORDING MEMBER

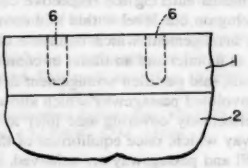
Motoyasu Terao, Hinodemachi; Yoshio Taniguchi, Hino; Shinkichi Horigome, Tachikawa; Masahiro Ojima, Kokubunji; Kazuo Shigematsu, Kawasaki; Keizo Kato, Hachioji; Yoshinori Miyamura, Hinodemachi, and Seiji Yonezawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,661

Claims priority, application Japan, Jun. 22, 1979, 54-78203

Int. Cl.³ B32B *5/14*

U.S. Cl. 428—409 **7 Claims**



1. A recording member having a predetermined substrate, and a thin film which is formed on the substrate and which is formed with recesses for recording information when irradiated with a working beam; said thin film being formed of an inorganic material containing at least arsenic, selenium and tellurium, with the concentration of the selenium decreasing from a part of the film near the surface of said thin film towards a central part thereof and the concentration of the arsenic increasing from a part of the film near the surface towards the central part of said film; the concentration of selenium being at lest 50 atomic-% in a part of said thin film that is the closest to said surface thereof with the average concentration of selenium being at most 40 atomic-% over the whole thin film, and the concentration of arsenic being at most 15 atomic-% in a part of said thin film that is the closest to said surface thereof with the average concentration of arsenic being 5 to 35 atomic-% over the whole thin film.

4,348,462

ABRASION RESISTANT ULTRAVIOLET LIGHT CURABLE HARD COATING COMPOSITIONS

Rack H. Chung, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 129,297, Mar. 11, 1980. This application Jul. 11, 1980, Ser. No. 167,622

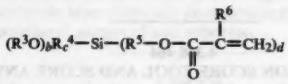
Int. Cl.³ C08F *2/50*

U.S. Cl. 428—412 **23 Claims**

1. A radiation curable coating composition having improved abrasion resistance, comprising:

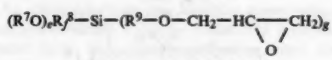
(A) 100 parts by weight silica provided as colloidal silica;

(B) 5 to 500 parts by weight of an acid hydrolysis product of a compound selected from acryloxy-functional silanes having a general formula:



$$(R^3O)_bR^4_cSi(R^5OC(=O)C(R^6)=CH_2)_d$$

wherein R^3 and R^4 are the same or different monovalent hydrocarbon radicals, R^5 is a divalent hydrocarbon radical having from 2 to 8 carbon atoms, R^6 is hydrogen or a monovalent hydrocarbon radical, b is an integer from 1 to 3, c is an integer from 0 to 2, and d is an integer equaling 4−b−c; or glycidoxy-functional silanes having a general formula:



$$(R^7O)_eR^8_fSi(R^9OCH_2CH(O)CH_2)_g$$

wherein R^7 and R^8 are the same or different monovalent hydrocarbon radicals, R^9 is a divalent hydrocarbon radical having from 2 to 8 carbon atoms, e is an integer from 1 to 3, f is an integer from 0 to 2, and g is a integer equaling 4−e−f, and mixtures thereof;

(C) 10 to 500 parts of a non-silyl acrylate; and

(D) a catalytic amount of ultraviolet light sensitive photoinitiator.

4,348,463

REFLECTOR

Akira Ohno; Hitomi Katayama; Suguru Nomura; Susumu Senaha; Suizo Kyo; Susumu Shmomura; Akira Akagami, and Hiroshi Imai, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd. and Yokohama Kiko Co., Ltd., both of Kanagawa, Japan

Filed Nov. 13, 1979, Ser. No. 93,554

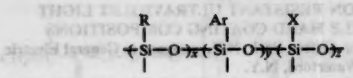
Claims priority, application Japan, Nov. 13, 1978, 53-138905

Int. Cl.³ G02B *5/08*; B32B *17/10, 15/08*

U.S. Cl. 428—429 **7 Claims**

1. A reflector comprising a resin layer disposed on a substrate surface capable of withstanding a vacuum deposition, operation of a light metal reflective layer and a crystalline ceramic layer thereon, said resin layer consisting essentially of a hard, abrasion-resistant, bending resistant, thermosett resin which in the form of a film has a high heat resistance, does not release low molecular weight substances under vacuum and withstands the heat generated during a vacuum deposition operation of a ceramic material, a vacuum deposited layer of a light reflective metal disposed on the resin layer and a vacuum deposited layer of a light transmittable crystalline ceramic further disposed on the reflective metal layer.

2. A reflector as set forth in claim 1 wherein said resin layer comprises silicone resin is obtained by polymerizing a liquid or low melting polyaralkylsiloxane consisting essentially of structural units having the general formula represented below:



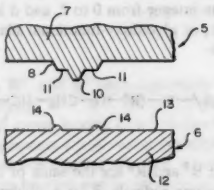
wherein R is lower alkyl radical; Ar is an aryl radical; X represents a functional group which will condense to form a polymer and x, y and z represent the molar proportion for the unit for which it is a subscript, respectively, the free bonds in the structural formula above may carry one of the aforesaid functional groups or the bonds in two structural units may link to form a bridging bond, and wherein (1) the mole faction of aryl radicals to the sum of the aryl and alkyl radicals is 0.65 to 1.00, (2) the polymerizable functionality is 2 to 3 and (3) the ratio of the number of carbon atoms to the number of silicon atoms is 4.25 to 16.

4,348,464

COMBINATION SCORE TOOL AND SCORE ANVIL

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,760
Int. Cl.³ B22F 7/00
U.S. Cl. 428—571 **12 Claims**



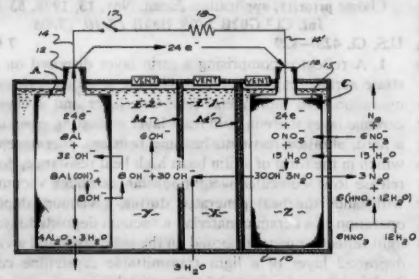
1. The combination of a score tool and score anvil wherein said score tool has a projecting rib for effecting scoring, said anvil has an article supporting surface and two spaced apart metal compressing ribs projecting from said supporting surface and generally opposing said scoring rib, and said scoring rib being positioned intermediate said compressing ribs for initially supporting an article to be scored.

4,348,465

NITROGEN METAL FUEL CELL

Ralph C. Struthers, Saugus, Calif., assignor to Universal Fuel Systems, Inc., Saugus, Calif.

Filed Nov. 10, 1980, Ser. No. 205,866
Int. Cl.³ H01M 8/08
U.S. Cl. 429—27 **18 Claims**



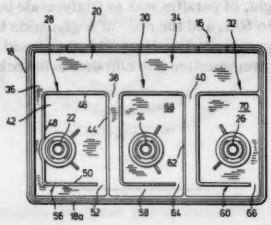
1. A fuel cell comprising a fuel metal anode, a nitrogen compound fuel cathode solution spaced from the anode, a hydroxyl ion transfer membrane between the anode and the cathode solution and carrying a metallic catalyst for the cathode solution, an aqueous electrolyte solution between and contacting the anode and the membrane, and an electric circuit connected with and conducting free electrons from the anode and to the cathode.

4,348,466

ANTI-SPILL DEVICE FOR ELECTROLYTE BATTERY

Wolodymyr R. Elehew, and Peter T. Kong, both of Scarborough, Canada, assignors to Varta Batteries Limited, Willowdale, Canada

Filed Jan. 27, 1981, Ser. No. 227,511
Int. Cl.³ H01M 2/12
U.S. Cl. 429—84 **10 Claims**



1. In a liquid electrolyte cell type battery having a plurality of cells, a battery container having defined therein a plurality of cell partitions and a battery cover sealed to said battery container to isolate the cells, said cover having means for venting to atmosphere gasses above the cell electrolyte level generated in each cell and means interposed each cell above its electrolyte level and said vent means for containing electrolyte which rises above an opening into said containment means when a battery is tipped to anyone of its sides, said containment means containing electrolyte to at least a level which causes relative to said opening a blockage of further flow of electrolyte into said containment means by preventing air from the venting means entering the respective cell, said containment means being on one level within said cover and comprising a partition arrangement which defines a chamber having said opening as its inlet and an outlet in communication with said vent means, said partition arrangement defining at least a partially convoluted passageway which allows said level of electrolyte effectively covering said inlet to seek a level in the passageway which, once equilibrium of the electrolyte levels in the cell and passageway are achieved, is spaced along said passageway from said outlet, said containment means thereby confining electrolyte away from said vent means and precluding electrolyte spillage regardless to which side the battery is tipped.

4,348,467

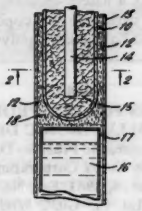
ELECTROCHEMICAL CELLS CONTAINING LIQUID SODIUM AS THE ANODIC MATERIAL

Michael L. Wright, Allestree, England, assignor to Chloride Silent Power Limited, London, England

Filed Jul. 7, 1981, Ser. No. 280,958
Claims priority, application United Kingdom, Jul. 21, 1980, 8023740
Int. Cl.³ H01M 4/00
U.S. Cl. 429—94 **4 Claims**

1. A sodium sulphur electrochemical cell having a solid

electrolyte separating a cathodic reactant from liquid sodium in an anodic region adjacent the surface of the electrolyte



wherein said anodic region contains aluminium particles in the form of flakes.

4,348,468

BETA ALUMINA SOLID ELECTROLYTE MATERIAL AND ITS MANUFACTURE AND ELECTROCHEMICAL CELLS OR OTHER ENERGY CONVERSION DEVICES CONTAINING SUCH MATERIAL

Michael L. Wright, Allestree, England, assignor to Chloride Silent Power Limited, London, England

Filed Dec. 17, 1980, Ser. No. 217,333
Claims priority, application United Kingdom, Dec. 28, 1979, 7944410
Int. Cl.³ H01M *10/39*
U.S. Cl. 429—193 3 Claims

1. A method of manufacture of a beta-alumina solid electrolyte element, suitable for use in an electrochemical cell or other energy-conversion device employing liquid sodium, which method includes the steps of pre-treating at least part of the surface area of the beta-alumina to be exposed to the liquid sodium with a lead compound and reducing the lead compound to metallic lead.

4,348,469

PHOTO-SENSITIVE MEDIUM FOR ELECTROPHOTOGRAPHY

Takao Komiya, Yokohama, and Mitsuo Minomiya, Tokyo both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 882,632, Mar. 2, 1978, abandoned, which is a continuation of Ser. No. 675,619, Apr. 9, 1976, abandoned, which is a continuation of Ser. No. 605,468, Aug. 18, 1975, abandoned, which is a continuation of Ser. No. 366,352, Jun. 4, 1973, abandoned. This application Jan. 13, 1981, Ser. No. 224,801
Claims priority, application Japan, Jun. 12, 1972, 47-58330
Int. Cl.³ G03G *5/14, 13/10*
U.S. Cl. 430—55 12 Claims

1. A process for developing an electrostatic image with a liquid developer on a photosensitive medium resistant to the deteriorating effects of the liquid developer, said process comprising the steps of applying an electrostatic charge of a first polarity to said photosensitive medium, imagewise exposing the resulting photosensitive medium while applying a charge of the opposite polarity to said first polarity or AC corona discharge thereto to an electric field capable of eliminating the electrostatic charge of said first polarity from the exposed area of said photosensitive medium to thereby form a latent electrostatic image on said photosensitive medium, and then treating said photosensitive medium with a liquid developer to develop the latent image, said photosensitive medium including:

an electrically conductive or dielectric substrate;

a photoconductive layer positioned on a portion of a surface of said substrate, wherein said layer does not extend along the peripheral portions of said substrate;

an adhesive layer positioned on said photoconductive layer and said peripheral margin of said substrate, said adhesive layer being resistant to the liquid developer; and

a transparent, dielectric resinous layer resistant to the liquid developer and capable of retaining an electrostatic charge, said dielectric layer having a thickness greater than about 25 microns and covering said photoconductive layer and extending around the entire periphery of the layer to thereby fully enclose said photoconductive layer and cover at least part of the peripheral portions of the substrate, said adhesive layer preventing separation of said dielectric layer from said photoconductive layer and said peripheral margin of said substrate.

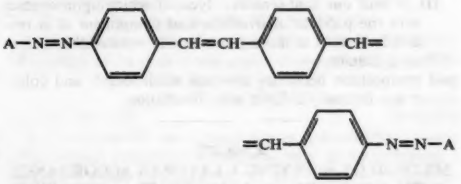
4,348,470

ELECTROPHOTOGRAPHIC ELEMENT CONTAINING DISAZO COMPOUNDS

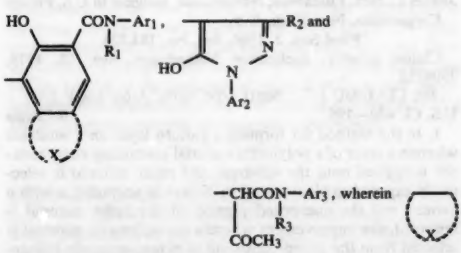
Akio Kozima, Hiratsuka; Eiichi Akutsu, Ichikawa, and Kiyomi Ichizuka, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,066
Claims priority, application Japan, Dec. 13, 1978, 53-154474
Int. Cl.³ G03G *5/06, 13/22*
U.S. Cl. 430—72 5 Claims

1. An electrophotographic element comprising an electroconductive substrate, a charge generating layer and a charge transport layer, said charge generating layer comprising a disazo pigment having the general formula:



wherein A is a member selected from the group consisting of



is a fused ring selected from the group consisting of benzene ring, halobenzene ring, naphthalene ring, indole ring, carbazole ring and benzofuran ring; Ar_1 is a member selected from the group consisting of phenyl, methylphenyl, methoxyphenyl, chlorophenyl, nitrophenyl, ethoxyphenyl, methylchlorophenyl, dimethylphenyl, methoxychlorophenyl, methoxybromophenyl, methoxymethylphenyl, dimethoxyphenyl, dimethoxychlorophenyl, dimethylaminophenyl, cyanophenyl, carboxyphenyl, benzenesulfonic acid sodium salt, tert-butoxyphenyl, naphthyl, methoxydibenzofuryl and carbazolyl; each

of Ar_2 and Ar_3 is a member selected from the group consisting of phenyl, naphthyl, methoxyphenyl, methylphenyl, acetylaminophenyl, dimethylaminophenyl, cyanophenyl, nitrophenyl, dinitrophenyl, chlorophenyl, trichlorobenzenesulfonic acid, benzenesulfonic acid and benzenesulfonamide; each of R_1 and R_3 is a member selected from the group consisting of hydrogen, methyl, ethyl, phenyl and chlorophenyl; and R_2 is a member selected from the group consisting of methyl, carboxyl and $-COOC_2H_5$, and a binder material consisting essentially of a mixture of polyvinyl butyral and acrylic resin, wherein the weight ratio of polyvinyl butyral to acrylic resin in said mixture is in the range of from 0.1:1 to 1:0.1, the amount of said mixture is 10 to 200% by weight, based on the weight of said disazo pigment, the thickness of said charge generating layer is in the range of from about 0.05 micron to about 2 microns and the thickness of said charge transport layer is in the range of about 5 microns to about 100 microns.

4,348,471

POSITIVE ACTING COMPOSITION YIELDING PRE-DEVELOPMENT HIGH VISIBILITY IMAGE AFTER RADIATION EXPOSURE COMPRISING ACID FREE NOVOLAK, DIAZO OXIDE AND ACID SENSITIVE DYESTUFF

James Shelnut, Carmel, and Richard J. Cohen, New Rochelle, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,819

Int. Cl.³ G03C *1/54, 1/60;* G03F *7/08*

U.S. Cl. 430—165 **9 Claims**

1. A positive-acting radiation-sensitive composition comprising an admixture of,

I. at least one acid-free novolak resin as the major resin component in the composition;

II. at least one positive-acting, radiation-sensitive diazo oxide which upon irradiation yields acidic products;

III. at least one acid-sensitive dyestuff which upon contact with the product of irradiation of component II is rendered colorless or much less intensely colored than before such contact,

said composition becoming aqueous alkali-soluble and colorless or less intensely colored after irradiation.

4,348,472

METHOD OF APPLYING A LAYER IN ACCORDANCE WITH A PATTERN ON A SUBSTRATE, A NEGATIVE RESIST MATERIAL AND A SUBSTRATE COATED WITH THE RESIST

Jannes C. Jagt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,521

Claims priority, application Netherlands, Sep. 18, 1979, 7906932

Int. Cl.³ G03C *1/71;* B05D *3/06;* G03C *1/60;* G03F *7/08*

U.S. Cl. 430—195 **6 Claims**

1. In the method for forming a pattern layer on a substrate wherein a layer of a polymeric material containing resist material is applied onto the substrate, the resist material is selectively exposed to electrons or to X-rays in accordance with a pattern and the unexposed portion of the resist material is removed, the improvement wherein the polymeric material is selected from the group consisting of hetero-aromatic halogenated derivatives of the vinyl carbazole polymer defined by formula 1 of the drawing where n exceeds 30, the vinyl carbazole polymer defined by formula 1 of the drawing where n exceeds 30 and copolymers thereof, and present at least when the polymeric material is other than a hetro-aromatic halogenated derivative of the vinyl carbazole polymer, a bisazide as defined by formula 2 of the drawing wherein R is an organic residue as defined by formulae 3, 4 or 5 of the drawing.

4. A negative electron and/or X-ray polymeric material containing resist material which resist material comprises a mixture of a bisazide defined by formula 2 or the drawing wherein R is an organic residue as defined by formulae 3, 4 or 5 of the drawing and a polymeric material consisting of a polyvinyl carbazole as defined by formula 1 of the drawing wherein n exceeds 30, a hetero-aromatic halogenated derivative of said polyvinyl carbazole or a copolymer of said polyvinyl carbazole and said halogenated polyvinyl carbazole.

4,348,473

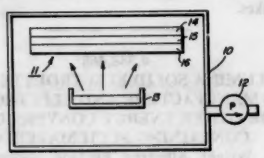
DRY PROCESS FOR THE PRODUCTION OF MICROELECTRONIC DEVICES

Koji Okumura, Rochester, and Franklin D. Saeva, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 4, 1981, Ser. No. 240,354

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—296 **9 Claims**



1. A method for the preparation of microelectronic devices which comprises:

providing in a vacuum chamber a substrate having coated thereon one or more substantially uniform layers of electronic circuit materials, and carrying out the following steps seriatum without intermediate withdrawal and reinsertion of the coated substrate from the vacuum chamber;

applying reduced pressure to the vacuum chamber;

depositing a thin layer of a monomer on said coated substrate while maintaining the coated substrate below the vaporization temperature of the monomer at the pressure within the vacuum chamber;

selectively polymerizing said thin layer of monomer by electromagnetic radiation or electron beam means according to a pattern of the microelectronic device desired;

heating said selectively polymerized thin layer to evaporate unpolymerized monomers to thus expose the coated substrate under the layer of monomer according to said pattern;

removing the electronic circuit materials so exposed; and

removing the layer of polymerized monomer from the coated substrate.

4,348,474

LIGHT SENSITIVE PHOTOGRAPHIC RECORDING MATERIAL AND THE USE THEREOF FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES

Rainer Scheerer, Cologne; Erwin Ranz, Leverkusen, and Joachim W. Lohmann, Odenthal, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 286,261

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029209

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—382 **9 Claims**

1. Photographic recording material having at least two panchromatically sensitised silver halide emulsion layers differing in speed, the faster layer being further removed from the support than the slower layer, and each of these two layers containing at least two colour couplers at least one of which produces a yellow dye on chromogenic development, wherein at least one layer contains a compound capable of splitting off a development inhibitor, and whereby the faster silver halide

emulsion layer contains a yellow coupler in a relatively rapidly coupling form and the slower layer contains a yellow coupler in a relatively slowly coupling form.

8. Process for the production of photographic images, wherein the material according to claim 1 is exposed imagewise and chromogenically developed.

4,348,475

PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES

Ubbo Wernicke, Odenthal, and Heinz Meckl, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1980, Ser. No. 143,152

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916836

Int. Cl.³ G03C 5/30

U.S. Cl. 430—399 1 Claim

1. A photographic development process which comprises processing exposed multi-layer color photographic material under development conditions to produce images of maximum density with a color developer composition having an effective bromide ion concentration equivalent to at least in excess of ten grams of potassium bromide per liter of color developer including the step of maintaining the said bromide ion concentration in said developer at a substantial constant by removing bromide ion from the developer by contacting the developer with a strongly basic ion exchange resin based on styrene-divinyl benzene and thereby removing bromide ions.

4,348,476

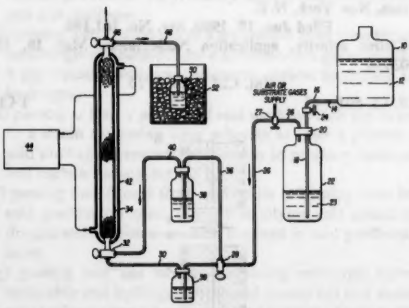
PRODUCTION OF EPOXIDES SUCH AS PROPYLENE OXIDE USING PACKED CATALYTIC BED CONTAINING MOIST RESTING CELLS EXHIBITING OXYGENASE ACTIVITY

Ching T. Hou, Edison, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 22, 1981, Ser. No. 227,135

Int. Cl.³ C12P 17/02

U.S. Cl. 435—123 24 Claims



1. A process for advancing the oxidation state of a gaseous, oxidizable organic substrate through contact with a gaseous source of oxygen and a biocatalyst comprising:

passing through a packed catalytic bed comprising moist, resting cells exhibiting oxygenase activity a gaseous, oxidizable organic substrate and a gaseous source of oxygen until the oxidative state of at least a portion of said substrate is increased, while maintaining the relative humidity in said bed at such a level that said cells remain moist and catalytically active until spent.

4,348,477

METHOD FOR PREPARING A RECOMBINANT DNA PHAGE

Eiichi Nakano, Sattemachi; Tsutomu Masuda; Narimasa Saito, both of Noda, all of Japan, and Danji Fukushima, Lake Genova, Wis., assignors to Noda Institute for Scientific Research, Noda, Japan

Filed Oct. 22, 1979, Ser. No. 87,166

Claims priority, application Japan, Oct. 30, 1978, 53-132631

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ C12N 15/00

U.S. Cl. 435—172 11 Claims

1. A method for preparing a novel recombinant DNA, which comprises (1) cleaving with an endonuclease a phage DNA having an endonuclease-sensitive region not in the DNA segment participating in temperate phage DNA replication and integration of DNA into a host chromosome but in other DNA segments, a temperate phage DNA having an endonuclease-sensitive region in the DNA segment carrying genetic information for the production of coat protein, and a DNA carrying intended genetic information, (2) mixing together all fragments produced by said cleaving, (3) adding DNA ligase to the mixture, and (4) recovering from the resulting mixture a phage DNA having its coat protein producing ability deleted by the replacement of the DNA segment carrying genetic information for coat protein production with a DNA fragment carrying the intended genetic information.

4,348,478

METHOD FOR PREPARATION OF A RECOMBINANT DNA PHAGE

Eiichi Nakano, Saitama; Tsutomu Masuda; Narimasa Saito, both of Noda, all of Japan, and Danji Fukushima, Lake Jenova, Wis., assignors to Noda Institute for Scientific Research, Noda, Japan

Filed Oct. 22, 1979, Ser. No. 87,167

Claims priority, application Japan, Oct. 25, 1978, 53-130437

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ L12N 15/00

U.S. Cl. 435—172 13 Claims

1. A method for the preparation of a novel recombinant DNA, which comprises (1) cleaving with an endonuclease a temperate phage DNA having an endonuclease-sensitive region not in the DNA segment participating in the replication of phage DNA and the integration of phage DNA into a host chromosome but at least in the DNA segment carrying genetic information for the coat protein production and another DNA carrying intended genetic information, (2) adding DNA-ligase to the mixture of both cleft DNA's, and (3) recovering from the mixture a phage DNA having its coat protein producing ability deleted by the replacement of the DNA segment carrying genetic information for the coat protein production with a DNA fragment carrying the intended information.

4,348,479

RECOVERY OF PROTEINACEOUS MATERIAL HAVING REDUCED NUCLEIC ACID LEVELS

John E. Kinsella, and Jayarama K. Shetty, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Aug. 18, 1980, Ser. No. 179,382

The portion of the term of this patent subsequent to Sep. 18, 1996, has been disclaimed.

Int. Cl.³ A23J 1/18

U.S. Cl. 435—183 8 Claims

1. A process of recovering microbially derived proteinaceous material essentially devoid of nucleic acid from nucleoprotein complexes which comprises:

(a) disrupting microbial cells to provide a mixture comprising proteinaceous material and nucleic acid;

(b) treating an aqueous mixture of proteinaceous material

and nucleic acid with an organic dicarboxylic anhydride containing a beta-diene structure at a pH of above about 7.5 thereby derivatizing the proteinaceous material;

(c) reducing the pH to isoelectrically precipitate the derivatized proteinaceous material and recovering the derivatized proteinaceous material which is thereby separated from nucleic acid;

(d) maintaining the recovered derivatized proteinaceous material at an acidic pH until the derivatized proteinaceous material disassociates into the proteinaceous material and the organic dicarboxylic anhydrides or a derivative thereof, and separating and recovering the proteinaceous material.

4,348,480

PROCESS FOR PRODUCING GLUCOSE ISOMERASE

Charles E. Brownewell, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 4, 1980, Ser. No. 156,496
Int. Cl.³ C12N *9/92*
U.S. Cl. 435—234 **1 Claim**

1. A process for the production of a glucose isomerase comprising growing under aerobic conditions a culture of *Bacillus licheniformis* ATCC 31604 in a medium containing appropriate nutrients and then recovering the enzyme therefrom.

4,348,481

METHOD OF OBTAINING GLUCOSE ISOMERASE

Mitko S. Popov; Galina M. Djedjeva; Ivan O. Todorov, and Nelly S. Stoeva, all of Sofia, Bulgaria, assignors to Institute Po Microbiologia, Sofia, Bulgaria

Filed Dec. 2, 1980, Ser. No. 212,094
Claims priority, application Bulgaria, Nov. 29, 1979, 45750
Int. Cl.³ C12N *9/92*
U.S. Cl. 435—234 **3 Claims**

1. A method for obtaining of glucose isomerase, wherein the enzyme-producing strain Streptomyces sp.N.765 registration N.143—State Institute for Drug Control, Sofia, Bulgaria, is cultivated for 36 to 72 hours in a culture medium with xylose as an inductor, the temperature being kept from 24° to 36° C., the initial pH of cultivation is from 6.5 to 9.0; the temperature of izomerization is from 50° to 90° C., pH is from 6.0 to 9.0 in the presence of $MgSO_4 \cdot 7H_2O$ in a concentration from 1.10^{-4} to 1.10^{-2}M and substrate concentration from 0.1 to 3 M.

4,348,482

PROCESS FOR DECREASING THE THERMAL STABILITY OF MICROBIAL RENNET

Dennis A. Cornelius, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 908,575, May 22, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 73,647
Int. Cl.³ C12N *9/58*; A23C *19/032*
U.S. Cl. 435—223 **18 Claims**

1. A process for treating a Mucor microbial rennet whereby the original milk-clotting activity thereof is not substantially reduced prior to any subsequent thermal treatment thereof and whereby the thermal stability of the microbial rennet is decreased to about the thermal stability of calf rennet when heated at the same temperature for pasteurizing whey which comprises contacting an aqueous solution thereof at a temperature between about 4° C. and 30° C.and at a pH between about 3.0 and 8.0 and for a time between about 15 minutes and 72 hours with a methionine-oxidizing means that oxidizes at least a portion of the methionine residues in the Mucor microbial rennet to methionine sulfoxide.

4,348,483

METHOD FOR THE PRODUCTION OF CHROMIUM YEAST

Lawrence E. Skogerson, Milwaukee, Wis., assignor to Universal Foods Corporation, Milwaukee, Wis.

Filed Jan. 23, 1981, Ser. No. 227,962
Int. Cl.³ C12N *1/16, 1/18*
U.S. Cl. 435—255 **14 Claims**

1. A process for producing a chromium yeast product which comprises:

(a) adjusting the pH of an aqueous suspension of live edible, food grade yeast cells from about 4 to about 7;

(b) treating an aqueous suspension of live yeast cells with a water-soluble, non-toxic chromium salt at a chromium ion concentration based on yeast cell solids that is below the concentration at which an inhibitory effect on the growth of the yeast is observed;

(c) maintaining the suspension for an essentially non-growth pre-treatment period sufficient to permit substantial intracellular absorption of chromium by said yeast cells;

(d) adding yeast growth nutrients to the aqueous medium containing the chromium-treated yeast and induce growth of the said yeast to thereby dilute the intracellular chromium content of said yeast to a predetermined level;

(e) recovering and concentrating the yeast cells from the aqueous growth medium;

(f) washing the recovered yeast cells to remove extra-cellular chromium salts; and

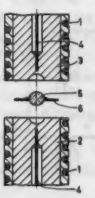
(g) pasteurizing and drying the washed yeast cells containing a substantial amount of intracellular chromium ion.

4,348,484

PRECISION PRESSED GLASS OBJECT, GLASS, METHOD OF PREPARING GLASS

Hendrik J. M. Joormann; Hendrik Verweij, and Jan Haisma, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 19, 1980, Ser. No. 161,196
Claims priority, application Netherlands, May 18, 1979, 7903914
Int. Cl.³ C03C *3/16*
U.S. Cl. 501—45 **1 Claim**



1. A method of preparing glass containing P_2O_5, PbO and BaO by fusing together starting materials of said oxides, characterized in that a glass is prepared which consists essentially of 45–55 mol. % P_2O_5, 15–40 mol. % BaO, 5–35 mol. % PbO, 5–15 mol. % Li_2O, 0–2 mol. % Al_2O_3 and 0–6 mol. % F, wherein up to 25% of the BaO may be replaced by an equimolar quantity of one or more of the oxides CaO, MgO, and SrO, and up to 25% of the Li_2O may be replaced by an equimolar quantity of one or more other alkali metal oxides.

4,348,485

SPINEL TYPE FUSED REFRACTORY PRODUCT

Koji Oohasi; Yutaka Hosoda; Toshio Kitamura, and Eiichi Kudo, all of Takasago, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,101
Claims priority, application Japan, Mar. 25, 1980, 55/36934
Int. Cl.[3] C04B *35/04, 35/42, 35/44*
U.S. Cl. 501—115 5 Claims

1. A spinel type dense fused refractory product having excellent corrosion resistance which comprises a crystalline structure consisting essentially of (a) 65%–80% by weight of composite spinel phase comprising RO component selected from MgO and FeO and R_2O_3 component selected from Cr_2O_3, Al_2O_3 and Fe_2O_3: (b) 19% to 30% periclase phase and (c) 1% to 8% of glass matrix phase; which product consists essentially of the following constituents, analytically on a weight basis: 20% to 40% of MgO; 30% to 60% of Cr_3O_3; 5% to 15% of Al_2O_3; 0.5% to 5% of SiO_2; 0.3% to 1.5% of CaO; and 15% or less of Fe_2O_3; wherein the ratio of Cr_2O_3 to Al_2O_3 is 3.5 to 5.5.

4,348,486

PRODUCTION OF METHANOL VIA CATALYTIC COAL GASIFICATION

William J. Calvin, Convent Station; Stuart S. Goldstein, Kinnelon, and Harry A. Marshall, Madison, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 27, 1981, Ser. No. 296,713
Int. Cl.[3] C07C *27/06*; C07L *31/04*
U.S. Cl. 518—704 11 Claims

1. A process for the production of methanol from a carbonaceous feed material which comprises:

(a) gasifying said carbonaceous feed material with steam in a gasification zone at a gasification temperature between about 1000° F. and about 1500° F. and at a gasification pressure in excess of about 100 psia in the presence of a carbon-alkali metal catalyst and added hydrogen and carbon monoxide;

(b) withdrawing from said gasification zone an effluent gas containing methane, carbon dioxide, steam, hydrogen, carbon monoxide, and hydrogen sulfide;

(c) treating said effluent gas for the removal of steam, particulates, hydrogen sulfide and carbon dioxide to produce a treated gas containing primarily carbon monoxide, hydrogen and methane;

(d) passing said treated gas to a separation zone wherein said treated gas is separated into a methane-rich gas stream and a gas stream containing primarily carbon monoxide and hydrogen;

(e) passing at least a portion of said methane-rich gas stream to a steam reforming zone wherein at least a portion of said methane is reacted with steam to produce hydrogen and carbon monoxide;

(f) passing the effluent from said steam reforming zone into said gasification zone, thereby supplying said added hydrogen and carbon monoxide required in said gasification zone;

(g) passing said gas stream containing primarily carbon monoxide and hydrogen produced in step (d) to a methanol synthesis zone wherein at least a portion of said carbon monoxide is reacted with at least a portion of said hydrogen in the presence of a methanol synthesis catalyst to form methanol;

(h) recovering methanol product from the effluent stream exiting said methanol synthesis zone, thereby leaving a gas comprised of carbon monoxide, hydrogen, methane and carbon dioxide; and

(i) recycling at least a portion of said gas comprised of carbon monoxide, hydrogen, methane and carbon dioxide produced in step (h) to the separation zone of step (d).

4,348,487

PRODUCTION OF METHANOL VIA CATALYTIC COAL GASIFICATION

Stuart S. Goldstein, Kinnelon; William J. Calvin, Convent Station, and Harry A. Marshall, Madison, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 2, 1981, Ser. No. 317,358
Int. Cl.[3] C07C *27/06, 31/04*
U.S. Cl. 518—704 10 Claims

1. A process for the production of methanol from a carbonaceous feed material which comprises:

(a) gasifying said carbonaceous feed material with steam in a gasification zone at a gasification temperature between about 1000° F. and about 1500° F. and at a gasification pressure in excess of about 100 psia in the presence of a carbon-alkali metal catalyst and added hydrogen and carbon monoxide;

(b) withdrawing from said gasification zone an effluent gas containing methane, carbon monoxide, steam, hydrogen, carbon dioxide and hydrogen sulfide;

(c) treating said effluent gas for the removal of steam, particulates, hydrogen sulfide and carbon dioxide to produce a treated gas containing primarily carbon monoxide, hydrogen and methane;

(d) passing said treated gas to a separation zone wherein said treated gas is separated into a methane-rich gas stream and a gas stream containing primarily carbon monoxide and hydrogen;

(e) passing said gas stream containing primarily carbon monoxide and hydrogen produced in step (d) to a methanol synthesis zone wherein at least a portion of said carbon monoxide is reacted with at least a portion of said hydrogen in the presence of a methanol synthesis catalyst to form methanol;

(f) recovering methanol product from the effluent stream exiting said methanol synthesis zone, thereby leaving a gas comprised of carbon monoxide, hydrogen, methane and carbon dioxide;

(g) passing at least a portion of said gas stream comprised of carbon monoxide, hydrogen, methane and carbon dioxide produced in step (f) to a steam reforming zone wherein at least a portion of said methane in said gas stream is reacted with steam to produce hydrogen and carbon monoxide; and

(h) passing the effluent from said steam reforming zone into said gasification zone, thereby supplying said added hydrogen and carbon monoxide required in said gasification zone.

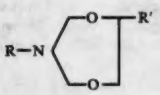
4,348,488

POLYURETHANES USING NOVEL N-SUBSTITUTED PERHYDRODIOXAZEPINES AS CATALYSTS

Robert L. Zimmerman, and Edward E. McEntire, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,311
Int. Cl.[3] C08G *18/20*
U.S. Cl. 521—115 12 Claims

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of an N-substituted perhydrodioxazepine of the formula



where R is alkyl, alkoxyalkyl, aminoalkyl or aryl alkyl and R′ is hydrogen or lower alkyl.

4,348,489

DIELECTRICALLY MODIFIED POLYURETHANE FOAM MATERIAL

Morey Weisman, 147-23 Charter Rd., Jamaica, N.Y. 11435

Continuation of Ser. No. 329,754, Feb. 3, 1973, abandoned. This application Mar. 27, 1981, Ser. No. 248,228

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—130 4 Claims

1. The method of imparting acceptable dielectric heating properties to a flexible polyurethane foam which comprises dispersing in a polyurethane foam-forming reaction mixture, which is polyether or polyester based, a non-plasticized thermoplastic additive chosen from the class consisting of polyvinyl chloride and polyvinyl acetate, said additive having a dielectric loss index which exceeds 0.2 in a proportion which modifies the loss index of the polyurethane foam product to an extent causing the product to have a loss index approaching 0.2 to impart thereto an acceptable heating response in a high-frequency electric field, causing said reaction mixture having the additive dispersed therein to foam and expand, said additive having a gell point in the range of about 275° F. to 300° F. which is lower than the temperature level of the exothermic reaction which takes place when said mixture is caused to foam and expand to an extent causing the additive to be distributed throughout and to interlace with the cellular structure of the foam, said additive being in the form of particles which are generally spherical in form and relatively large in diameter to a degree sufficient to prevent entrapment of air in the mixture, and curing said foamed and expanded mixture to produce a hole-free foam product with dielectric properties having a dielectric loss index approaching 0.2 whereby the product may be welded, sealed, embossed or laminated to similar or dissimilar materials using standard dielectric heating techniques at power and frequency levels comparable to those usable with polyvinyl chloride materials.

4,348,490

FRICTION MATERIAL

Osao Ogiwara, Hanyu, Japan, assignor to Akebono Brake Industry Company, Ltd., Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,706

Claims priority, application Japan, Jan. 30, 1980, 55/9810

Int. Cl.³ C08K *00/00*

U.S. Cl. 523—156 4 Claims

1. A friction material for braking, wherein a composition containing 5–60 wt.% of a ferrous fiber, 0.3–20 wt.% of a carbon fiber and/or a phenol fiber less than 10 mm in length and comprising 0.5–15 wt.% of an organic dust, 2–20 wt.% of an inorganic filler, 5–25 wt.% of lubricant, 0.2–10 wt.% of an antimony trioxide and 0–20 wt.% of a metallic powder is formed with 3–15 wt.% of a phenol binder under heat and pressure.

4,348,491

HEAT STABLE MOLDED PHENOLIC RESIN ARTICLE

Michael D. Bertolucci, and John R. Bartolomucci, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 123,406, Feb. 21, 1980, abandoned. This application Oct. 7, 1981, Ser. No. 309,376

Int. Cl.³ C08L *61/10*

U.S. Cl. 523—214 18 Claims

1. A molded article exhibiting improved thermal stability consisting essentially of, in percent by weight, of:

(i) from about 20 to about 70 percent of an oil unmodified phenolic resin;

(ii) from about 3 to about 25 percent of an acrylonitrile-butadiene copolymer; and

(iii) from about 15 to about 70 percent of at least one silicate mineral.

4,348,492

STARCH ADDUCT ENCASEMENT OF PARTICULATE ELASTOMERS

Baruch S. Shasha, and Thomas P. Abbott, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 30, 1980, Ser. No. 202,395

Int. Cl.³ C08L *3/04, 21/00*

U.S. Cl. 524—52 10 Claims

1. A method of preparing a free-flowing, nonagglomerating, particulate elastomer composition from wet, coagulated particles of an emulsion elastomer material, wherein said particles have a pH in the range of about 6-8, said method comprising:

a. preparing a dispersion of said particles in a film-forming material comprising an aqueous paste of a starch-containing material (SCM) alkoxide, wherein said paste has a solids concentration of SCM alkoxide of from about 6–20% and wherein the relative amount of said SCM alkoxide with respect to said elastomer material is in the range of about 4% to about 100%, on a dry weight basis;

b. reacting said SCM alkoxide with a suitable bivalent cation selected from the group consisting of calcium, barium, and strontium to form an insolubilized coating around said particles;

c. removing excess water from said coated elastomer particles; and

d. recovering said free-flowing particulate elastomer composition.

4,348,493

NOVEL LIGHT STABILIZERS FOR POLYMERS

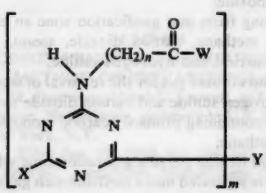
Frank F. Loffelman, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 284,885

Int. Cl.³ C07D *401/12, 401/14;* C08K *5/34*

U.S. Cl. 524—100 15 Claims

1. A compound of the formula (I)

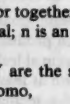


(I)

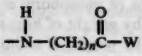
wherein W represents C_1–C_{20} alkoxy, or

wherein R and R^1 are the same or different and each represent hydrogen, C_1–C_{20} alkyl, or together form a piperidino, pyrrolidyl, or morpholino radical; n is an integer from 1 to 3; and m is an integer from 1 to 6;

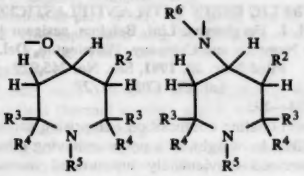
when m is 1, X and Y are the same or different and each represent chloro, bromo,



wherein R and R^1 are as previously defined, C_1–C_{12} alkoxy, C_1–C_{12} alkylthio,

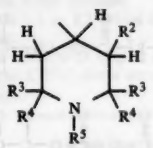


wherein n and W are as previously defined, or the radicals (II) or (III)



(II) (III)

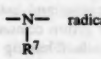
wherein R^2 represents hydrogen, C_1–C_8 alkyl, or benzyl; R^3 and R^4 independently represent C_1–C_8 alkyl, benzyl, or phenethyl, or together with the carbon to which they are attached form a C_5–C_{10} cycloalkyl; R^5 represents hydrogen, C_2–C_3 hydroxyalkyl, C_1–C_8 alkyl, hydroxyl, or oxyl; R^6 represents hydrogen, C_1–C_{20} alkyl, or the radical (IV)



(IV)

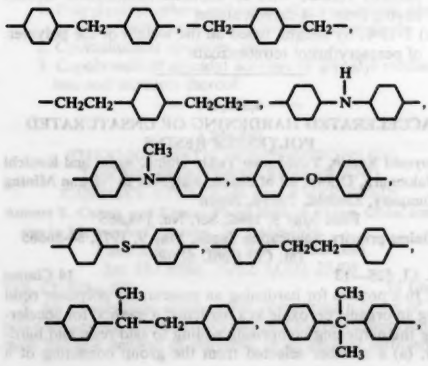
wherein R^2, R^3, R^4, and R^5 are as previously defined; with the proviso that at least one X or Y, must contain a piperidinyl moiety (IV); and

when m is an integer from 2 to 6, X is as previously defined; Y is an m-valent radical derived from a polyamine, polyalcohol, or polymercaptan containing a C_2–C_{20} alkylene chain, either straight-chained or branched, wherein the alkylene chain may be interrupted by oxy, thio, or



radicals,

wherein R^7 represents hydrogen, C_1–C_{20} alkyl, or the moiety (IV); C_5–C_{10} cycloalkylene,



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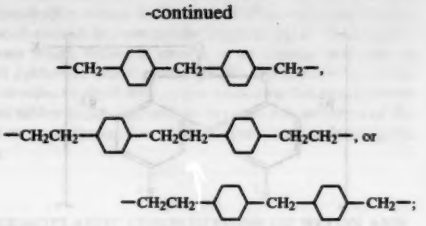


C_6–C_{12} arylene; or C_8–C_{14} arylenedialkylene; with the proviso that at least one piperidinyl moiety (IV) is present in X or Y.

9. A method for stabilizing a polymer which is normally subject to degradation by ultraviolet radiation which comprises incorporating into said polymer an ultraviolet stabilizingly effective amount of a compound of claim 1.

4,348,494

LIQUID, SOLVENT-FREE, NON-TOXIC STABILIZERS AND VINYL CHLORIDE RESIN COMPOSITIONS CONTAINING SAME

Mahmoud Kheidr, and Irene A. E. Fraser, both of Toronto, Canada, assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Jun. 10, 1980, Ser. No. 158,101
Claims priority, application Canada, Sep. 19, 1979, 335950
Int. Cl.³ C08K 5/15
U.S. Cl. 524—114 **9 Claims**

1. A liquid, solvent-free, non-toxic stabilizer for vinyl chloride resin compositions that comprises

(a) 40% to 90% by weight of a liquid epoxy compound that is an ester of epoxidized fatty acids having 14 to 22 carbon atoms;

(b) 1% to 10% by weight of a magnesium salt of an alkanoic acid having 6 to 26 carbon atoms;

(c) 1% to 10% by weight of a zinc salt of an alkanoic acid having 6 to 26 carbon atoms;

(d) 1% to 10% by weight of a calcium salt of an alkanoic acid having 6 to 26 carbon atoms;

(e) 1% to 10% by weight of thiodipropionic acid; and

(f) 1% to 30% by weight of an organic phosphite selected from the group consisting of secondary and tertiary alkyl, aryl, and alkyl aryl phosphites in which the alkyl groups have 3 to 18 carbon atoms and the aryl groups are phenyl or alkylphenyl in which each alkyl group has 4 to 12 carbon atoms.

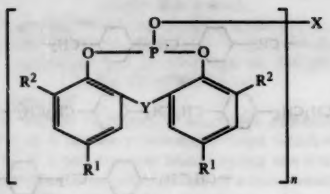
4,348,495

PHOSPHOROUS ACID ESTERS AND THEIR USE FOR STABILIZING POLYAMIDES

Hans-Josef Buysch; Bert Brassat; Erich Elmers, and Karl H. Hermann, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 68,210, Aug. 20, 1979, Pat. No. 4,252,750.
This application Sep. 22, 1980, Ser. No. 189,719
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2837027
Int. Cl.³ C08K 5/52
U.S. Cl. 524—117 **7 Claims**

1. A polyamide composition containing 0.02 to 5% by weight of a stabilizer of the formula:



wherein

R^2 is a benzyl, α-methylbenzyl, α,α-dimethyl benzyl, cyclopentyl or cyclohexyl group;

R^1 is an alkyl, a cycloalkyl radical, an aralkyl or an aryl group;

Y is a sulphur atom or a group

in which R^3 is a hydrogen atom, an alkyl, cyclohexyl or cyclohexenyl group;

X is a hydrogen atom, a single-bond to four-bond straight-chain or branched-chain aliphatic group, an aralkyl group or an aromatic group, each of which groups may contain an olefinic double bond or a hetero atom selected from N, O and S and be unsubstituted or substituted by a hydroxyl, alkoxy having 1 to 4 carbon atoms, amino, alkylamino having 1 to 8 carbon atoms, dialkylamino having 1 to 8 carbon atoms in each alkyl, —SH, alkyl mercapto having 1 to 4 carbon atoms, alkyl having 1 to 12 carbon atoms, aralkyl having 7 to 12 carbon atoms, aryl having 6 to 10 carbon atoms or aroxy having 6 to 10 carbon atoms; and

n is an integer of from 1 to 4, with the proviso that when X is a hydrogen atom n is 1.

4,348,496

CARBOXYLATED MONOMER/VINYL CHLORIDE/VINYL ACETATE TERPOLYMER EMULSIONS, PROCESS OF PRODUCTION AND USE

Rudolf Pube; Werner Frey, and Günter Weinhold, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,453

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009148

Int. Cl.³ C08K *5/11, 5/12, 5/52*

U.S. Cl. 524—127 **7 Claims**

1. A paste capable of being gelled at low temperatures consisting essentially of:

100 parts by weight of a pastable emulsion polymer comprised of carboxylated monomer/vinyl chloride/vinyl acetate terpolymer having improved strength of adhesion produced by emulsion copolymerization and containing, per polymer weight,

from 60% to 98% by weight of vinyl chloride monomer units,

from 1% to 29% by weight of vinyl acetate monomer units, and

from 1% to 15% by weight of carboxyl-containing monomer units selected from the group consisting of olefinically-unsaturated monocarboxylic acids, monoallyl esters of non-ethylenically-unsaturated dicarboxylic acids and monovinyl esters of non-ethylenically-unsaturated dicarboxylic acids, and recovered by spray drying or roll drying,

from 10 to 100 parts by weight of at least one plasticizer selected from the group consisting of esters of alkanols having from 6 to 18 carbon atoms or phenols or alkylphenols having from 1 to 18 carbon atoms in the alkyl with dicarboxylic acids or phosphoric acid,

from 0 to 10 parts by weight of heat stabilizers and

from 0 to 10 parts by weight of additives selected from the group consisting of dyestuffs, pigments, fillers and UV-absorbers.

4,348,497

ACRYLIC RESIN WITH ANTIPLASTICIZER

Jacques M. L. Berghmans, Lint, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

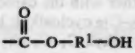
Filed Mar. 20, 1981, Ser. No. 245,929

Int. Cl.³ C08L *61/28*

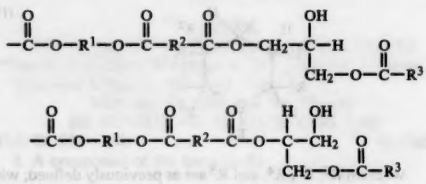
U.S. Cl. 524—293 **4 Claims**

1. A liquid coating composition comprising solvents and

(a) 93–50%, by weight, of a polymer having a backbone of polymerized ethylenically unsaturated monomers and having ester groups attached directly to its backbone, said ester groups comprising about 10 to 75 percent of the total weight of the polymer and consisting essentially of Ester Group (A)



and Ester Group (B) selected from the group consisting of



or

mixtures thereof, wherein the molar ratio of Ester Group (A) to Ester Group

(B) is from about 1:1.5 to 1:2.5; and wherein

R^1 is a saturated hydrocarbon radical containing 2–10 carbon atoms;

R^2 is selected from the group consisting of alkylene, vinylene, aromatic, carbocyclic and heteroradicals, and

R^3 is selected from the group consisting of a saturated aliphatic hydrocarbon radical having one to 26 carbon atoms and an ethylenically unsaturated aliphatic hydrocarbon radical having 12 to 18 carbon atoms;

(b) 5–50% by weight, based on the weight of the polymer, of a melamine formaldehyde resin which has been at least partially reacted with an aliphatic monohydric alcohol having from 1–4 carbon atoms;

(c) 2–15%, by weight, based on the weight of the polymer, of pentaerythritol tetrabenzoate.

4,348,498

ACCELERATED HARDENING OF UNSATURATED POLYESTER RESINS

Hiroyoshi Kamio, Yokohama; Yukio Ogino, Ageo, and Kouichi Nakamura, Urawa, all of Japan, assignors to Nippon Mining Company, Limited, Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,355

Claims priority, application Japan, May 9, 1979, 54-56585

Int. Cl.³ C08L *67/06*

U.S. Cl. 525—13 **14 Claims**

1. In a process for hardening an unsaturated polyester resin using an organic peroxide as a hardener, a method for accelerating the hardening comprising adding to said resin and hardener, (a) a member selected from the group consisting of a

zirconium chelate compound, a titanium chelate compound and a mixture thereof and (b) a member selected from the group consisting of a cobalt compound, a manganese compound and a mixture thereof, as a hardening accelerator.

4,348,499

HEAT RESISTANT LOW SHRINK POLYESTER RESINS

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 82,245, Oct. 5, 1979, abandoned. This application Aug. 28, 1980, Ser. No. 182,284

Int. Cl.[3] C08G *63/52;* C08L *67/06*

U.S. Cl. 525—49 14 Claims

1. A polyester resin which has lower shrinkage during curing and excellent thermal stability which is the product produced by the steps comprising

(A) reacting an alpha, beta-ethylenically unsaturated dicarboxylic anhydride with from 0.1 to 0.9 moles of water per mole of anhydride at a temperature ranging from 30° C. to 150° C. for a period of time to complete the anhydride hydrolysis,

(B) adding about 0.2 to 1.3 moles of a C_{10} hydrocarbon concentrate per mole of anhydride to the reaction mixture from step A,

(C) heating the mixture from step B at a temperature ranging from 80° to 130° C. for a period of time sufficient to carry out the addition reaction,

(D) heating the reaction product of step C at a temperature ranging from 140° to 185° C. for a period of time to complete the Diels-Alder reaction,

(E) adding about 0.5 to 1.5 moles of a polyol per mole of anhydride, and

(F) heating the mixture of step E at a temperature range from 140° C. to 215° C. for a time sufficient to produce a polyester resin.

4,348,500

POLYARYLATE COMPOSITIONS HAVING IMPROVED HYDROLYTIC STABILITY

Lloyd M. Robeson, Whitehouse Station, N.J., and Ted T. Szabo, Westport, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 24, 1980, Ser. No. 219,872

Int. Cl.[3] C08L *63/00*

U.S. Cl. 525—65 46 Claims

1. A molding composition comprising a blend of:

(a) from about 25 to about 90 weight percent of a polyarylate derived from a dihydric phenol and an aromatic dicarboxylic acid,

(b) from about 10 to about 75 weight percent of a polyester derived from an aliphatic or cycloaliphatic diol and at least one aromatic dicarboxylic acid, and

(c) from about 0.1 to about 5.0 weight percent of an epoxide having at least two epoxy groups per molecule and selected from the group consisting of

1. Polyglycidyl ethers and esters of a polyhydric phenol or other active hydrogen containing compounds
2. Cycloaliphatic epoxides, and
3. Copolymers of glycidyl acrylate or glycidyl methacrylate and mixtures thereof.

4,348,501

THERMOPLASTIC COMPOSITIONS OF EPICHLOROHYDRIN RUBBER AND CARBOXY-ETHYLENE POLYMER RESIN

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 27, 1981, Ser. No. 258,186

Int. Cl.[3] C08L *15/02, 63/00, 23/08*

U.S. Cl. 525—179 11 Claims

1. An elastoplastic composition comprising a blend of carboxy containing ethylene polymer (CEP) resin comprising at least 50 mole percent of ethylene, in an amount sufficient to impart thermoplasticity to the composition, and cross-linked epichlorohydrin rubber in the form of dispersed particles of a size small enough to maintain thermoplasticity of the composition and which rubber is present in an amount sufficient to impart rubberlike elasticity so that the composition has a tension set value of about 50% or less, said cross-linked epichlorohydrin rubber being obtained by dynamic vulcanization of the blend or by vulcanization of the rubber prior to forming the blend.

4,348,502

THERMOPLASTIC COMPOSITIONS OF NYLON AND ETHYLENE-VINYL ACETATE RUBBER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 23, 1981, Ser. No. 227,893

Int. Cl.[3] C08L *77/02, 77/00*

U.S. Cl. 525—183 12 Claims

1. A thermoplastic composition comprising a blend of about 15 to 75 parts by weight of nylon and about 85 to 25 parts by weight of cured EVA rubber per 100 parts by weight of nylon and said EVA rubber combined in which the EVA rubber is an essentially amorphous copolymer of ethylene and 40 to 70 weight percent of vinyl acetate and is cured to the extent that the EVA rubber is at least 90 percent insoluble in toluene at room temperature.

4,348,503

ADHESIVE COMPOSITION

Andrew G. Bachmann, Burlington Rd., Harwinton, Conn. 06791

Filed Jun. 4, 1980, Ser. No. 156,475

Int. Cl.[3] C08L *75/12;* C05L *75/04*

U.S. Cl. 525—455 14 Claims

1. As a nonanaerobic adhesive composition, the combination of an adhesive and a latent catalyst system, said adhesive comprising:

a. about 40 to 90 parts per hundred of an acrylic ester monomer capable of free-radical polymerization, and

b. about 60 to 10 parts per hundred of a monomeric polyacrylate ester prepolymer having terminal acrylate radicals linked by at least two divalent polyurethane or polyureide groups, said acrylic ester monomer and polyacrylate ester prepolymer producing, upon polymerization thereof, an adhesive solid;

said catalyst system comprising, in amounts based upon the weight of said adhesive:

c. about 1 to 10 parts per hundred of an aromatic perester free-radical precursor,

d. about 0.5 to 10 parts per hundred of an organic acid capable of cyclic tautomerism, and

e. up to about 500 parts per million of a soluble compound of a transition metal cure accelerator;

said composition being free from any organic hydroperoxide catalyst.

4,348,504

METHOD FOR MAKING BLOCK SILOXANE COPOLYMERS

Nora Butler; Edward S. Jessop, and John R. Kolb, all of Livermore, Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 25, 1981, Ser. No. 238,235

Int. Cl.[3] C08G *67/00, 77/08, 77/32*

U.S. Cl. 525—477 11 Claims

1. A method for synthesizing polysiloxane polymers comprising:

(a) interacting the following to produce a first reaction product,

(i) a diorganocyclosiloxane selected from the group consisting of $(Me_2SiO)_4$, $(\phi_2SiO)_4$, $(MeViSiO)_4$, $(Et_2SiO)_3$,

$(\phi_2SiO)_3$, $(MeViSiO)_3$, $(Et\phi SiO)_3$, $SiO\phi_2SiOMe_2SiO$, and $SiO\phi_2SiOMeViSiO$,

(ii) an organosilylamine having the general formula,

$$Me_2N(SiR_2O)_nSiMe_2NMe_2$$

wherein each R radical is independently selected from the group consisting of —Me, —Et, —Vi, —ϕ, and mixtures thereof, and n is an integer from 2 to 12 inclusive, and

(iii) a catalyst of the general formula

$$Me_4N^+{}^-O(SiMe_2O)_nH$$

wherein n is approximately 4; and

(b) reacting the reaction product of step (a) with a silanediol selected from the group consisting of $Si\phi_2(OH)_2$, $O(Si\phi_2OH)_2$ and $HO(SiMe_2O)_nH$ wherein n is a an integer from 15 to 20 inclusive to produce a second reaction product.

4,348,505

ADDUCTS FROM AMINES AND DI- AND POLYEPOXIDES

Marianne Di Benedetto, Pleasantville, N.Y., and John A. Gannon, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 171,520, Jul. 23, 1980, abandoned. This application Nov. 28, 1980, Ser. No. 210,890

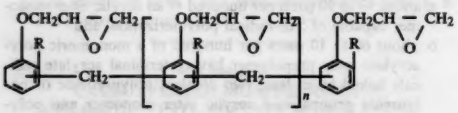
Int. Cl.³ C08G *59/64, 59/14*

U.S. Cl. 525—504 **10 Claims**

1. A curing agent for epoxy resins comprising the adduct, free of epoxy groups, obtained from the reaction of

(a) an amine;

(b) a polyepoxide resin having a functionality greater than two and being either (i) the epoxidation product of cresol novolac resins corresponding to the formula



wherein R is CH_3 and n is 0.2–3.4, or

(ii) triglycidyl p-aminophenol; and, optionally, an accelerator for said curing operation and a solvent for said curing agent; said amine being present in excess relative to said polyepoxide resin.

4,348,506

PROCESS FOR CURING VINYL ESTER RESINS AND COMPOSITION USEFUL THEREIN

Kalyan K. Ganguli, Broken Arrow, Okla., and David A. Wilson, Richwood, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 64,235, Aug. 6, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 226,343

Int. Cl.³ C08L *63/00, 65/10*

U.S. Cl. 525—512 **13 Claims**

1. In the method for suppressing foam generation during the cure of a vinyl ester resin with a ketone peroxide initiator and a cobalt salt promoter, the improvement wherein said promoter is selected from the group consisting of (a) a complex of equivalent amounts of a cobalt salt and an aldimine chelating agent which is the reaction product of equivalent amounts of salicylaldehyde and a polyamine or (b) cobalt naphthenate and about an equivalent amount of aldimine chelating agent which is the reaction product of salicylaldehyde and a polyamine or (c) a combination of (a) and (b).

4,348,507

CATALYST COMPONENT FOR USE IN THE POLYMERIZATION OF α-OLEFINS AND A METHOD OF USING THE SAME

Hiroshi Ueno, Namekawa; Masafumi Imai; Naomi Inaba, both of Ooi; Makoto Yoda, all of Kawagoi, and Shozo Wada, Zushi all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 29,083, Apr. 11, 1979, Pat. No. 4,242,231. This application Jul. 28, 1980, Ser. No. 173,214

Claims priority, application Japan, Apr. 12, 1978, 53/42148

Int. Cl.³ C08F *4/02, 10/06*

U.S. Cl. 526—125 **5 Claims**

1. In a process for the stereoregular polymerization of α-olefins, wherein an α-olefin is contacted, under α-olefin (co)-polymerization conditions, with a catalyst system comprising a titanium catalyst component and an organo aluminum catalyst component prepared by mixing an organo aluminum compound and an organic acid ester, the improvement comprising:

the titanium catalyst component being obtained by co-grinding, in combination, a magnesium halide, a tetravalent titanium halide in the amount of from about 0.1 to about 10 percent by weight as supported titanium metal in the resulting titanium-containing solid product, from about 0.1 to about 10 moles per 1 gram atom of supported titanium metal of an organic acid ester and an organohalogen compound in proportion of 1 to 100 percent by weight to the magnesium halide, said organohalogen compound being one of mono- or polyhalo-substituted saturated aliphatic or saturated alicyclic hydrocarbons having from 1 to 20 carbon atoms.

4,348,508

3-SUBSTITUTED-7-ALKOXY-2,2'-SPIROBI[2H-1-BENZOPYRANS]

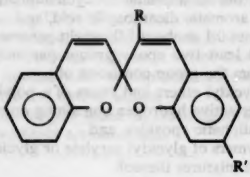
John E. Herweh, Lancaster; Thomas B. Garrett, Lititz, and Alan B. Magnusson, Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jun. 25, 1981, Ser. No. 277,175

Int. Cl.³ C08F *234/02;* **C07D** *311/96*

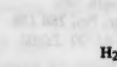
U.S. Cl. 526—268 **5 Claims**

1. A spirobipyran compound having the formula



wherein R represents C_1–C_{12} alkyl, alkylene aryl, aryl or unsaturated alkyl and R′ represents alkoxy.

4. A copolymer produced by the free radical polymerization of a spirobipyran compound of claim 1 and an acrylate of the formula



wherein X is H or CH_3 and X′ is H or a straight or branched alkyl group having from 1 to 12 carbon atoms.

4,348,509

ALKOXYALKANOIC ACID PREPARATION

Andrea Sanders, Katy, Tex., and Leo Kim, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 6, 1981, Ser. No. 280,737
Int. Cl.³ C07C *51/235*
U.S. Cl. 562—538 7 Claims

1. A process for preparing an alkoxyalkanoic acid of the formula:

$$RO(CH_2CHR'O)_n\,CH_2CO_2H$$

wherein R is an alkyl group of 1 to about 22 carbon atoms, R' is hydrogen or methyl or a mixture thereof (on the individual molecule) and n is an integer of from 1 to about 12 by reacting the corresponding alkoxyalkanol with oxygen at a temperature of from about 50° to about 110° C. in the presence of a catalyst comprising platinum supported on a macroreticular crosslinked polystyrene/divinylbenzene resin having a surface area ranging from about 700 to about 900 m^2/g.

4,348,510

LINEAR BLOCK COPOLYESTERS HAVING IMPROVED SLIP CHARACTERISTICS

Max H. Keck, Cuyahoga Falls, and Paul R. Ginnings, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 12, 1981, Ser. No. 273,160
Int. Cl.³ C08G *77/04*
U.S. Cl. 528—26 8 Claims

1. A random, linear, thermoplastic block copolyester, extruded and molded articles of which exhibit improved clarity and nonsticking characteristics when tested in accordance with ASTM test D-1894, consisting essentially of the polymeric reaction product of a mixture of reactants comprising

(A) at least one reactant selected from the groups of reactants consisting of

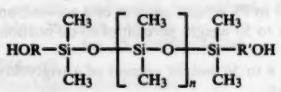
(1) aromatic dicarboxylic acids or the C_1 to C_4 dialkyl esters thereof and

(2) aliphatic dicarboxylic acids or the C_1 to C_4 dialkyl esters thereof

wherein the reactant selected from group (1) constitutes from 100 to 50 mol percent of the total mols of reactant (A) and the reactant selected from group (2) constitutes from 0 to 50 mol percent of the total mols of reactant (A);

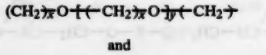
(B) from about 100 to about 300 mol percent, based on the total mols of reactant (A) of at least one reactant selected from the group consisting of alkylene glycols containing from 2 to 10 carbon atoms; and

(C) from about 0.75 to about 3.50 weight percent, based on the weight of the polymeric reaction product, of a dihydroxy terminated polydimethylsiloxane block copolymer of the general formula



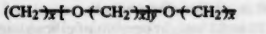
(I)

where n is an integer ranging from about 8 to about 15 and R and R' are divalent polymethylene oxide radicals corresponding to the general formulae



(II)

and



(III)

respectively wherein x is an integer ranging from about 2 to about 8 and y is an integer ranging from about 8 to about 15 and wherein said dihydroxy terminated polymethylsiloxane block copolymer has a molecular weight ranging from about 1600 to about 5500.

4,348,511

PROCESS FOR THE PREPARATION OF CROSSLINKED, UNSATURATED POLYMERS AND THE POLYMERS THUS OBTAINED

Theobald Haug, Frenkendorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,322
Claims priority, application Switzerland, May 7, 1980, 3554/80
Int. Cl.³ C08G *18/34*
U.S. Cl. 528—72 14 Claims

1. A process for the preparation of crosslinked unsaturated polymers, which comprises reacting a mixture, containing substantially stoichiometric amounts of a di-isocyanate or polyisocyanate and of a polyol, with a monomeric or oligomeric β-aminocrotonic acid ester or β-aminocrotononitrile or β-aminocrotonamide, the ratio of the isocyanate component to the β-aminocrotonic acid derivative component being chosen so as to provide not less than one isocyanate group per molecular group of the formula

of the particular β-aminocrotonic acid derivative.

4,348,512

POLYISOCYANATE REACTION PRODUCTS OF DIISOCYANATES AND S-TRIAZINE DERIVATIVES CONTAINING AMINO GROUPS, AND POLYMERS THEREFROM

Gerhard Grögler, Leverkusen, and Holger Meyborg, Odenthal-Gloebusch, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 930,611, Aug. 3, 1978, Pat. No. 4,255,570. This application Nov. 12, 1980, Ser. No. 206,115
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737402
Int. Cl.³ C08G *18/77*
U.S. Cl. 528—73 1 Claim

1. A process for the production of polyurethane resins comprising reacting

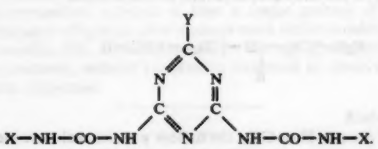
(A) polyisocyanates with

(B) compounds cntaining active hydrogen atoms,

(C) fillers optionally in the presence of

(D) catalysts and other known additives

wherein said fillers comprise polyisocyanates of the general formula



wherein

X represents a radical of the type obtained by removing the more reactive isocyanate group from an organic diisocyanate containing isocyanate groups of different reactivity; and

Y represents a chlorine, bromine, C_1–C_8 alkyl, C_1–C_8 alkoxy, C_6–C_{10} aryl, C_6–C_{10} aroxy radical or a radical corresponding to the general formula: —NH—CO—NH—X.

4,348,513

INJECTION MOLDABLE AMIDE-IMIDE COPOLYMERS AND TERPOLYMERS

Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

PCT No. PCT/US81/00077, § 371 Date Jan. 7, 1981, § 102(e) Date Jan. 7, 1981
Continuation-in-part of Ser. No. 112,651, Jan. 16, 1980, Pat. No. 4,291,149. This PCT application Jun. 7, 1981, Ser. No. 261,127
The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.
Int. Cl.³ C08G 73/14
U.S. Cl. 528—188 47 Claims

1. A process for the preparation of tailored linear injection moldable polyamide-imide copolymers and terpolymers containing both aromatic and aliphatic moieties derived from aromatic and aliphatic diamines which process comprises reacting at a temperature of about 50° to 700° F. fully or partially acylated aromatic or aliphatic diamines or mixtures of fully or partially acylated aromatic and aliphatic diamines with tricarboxylic acid anhydride compounds and aliphatic or aromatic diamines or mixtures of aromatic and aliphatic diamines wherein the ratio of the total moles of fully or partially acylated diamines and unacylated diamines to the tricarboxylic acid anhydride compound is about 1:1 and about 40 to 100% of the total amine functionality is acylated.

4,348,514

POLYAMINES CONTAINING UREA GROUPS

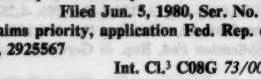
Wilfried Löbach, Bonn; Günter Kolb; Wolfgang Lehmann, both of Leverkusen; Günther Cramm, Cologne; Friedhelm Müller, Odenthal, and Janos Muszik, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,832
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925567
Int. Cl.³ C08G 73/00
U.S. Cl. 528—367 6 Claims

1. A non-crosslinking, water-soluble polyamine obtained by reacting

(A) a basic polyurea which has been prepared by condensation of a urea with a polyamine containing at least three amino groups, of which at least one is a tertiary amino group, or with a mixture of such a polyamine with an aliphatic, araliphatic, cycloaliphatic or heterocyclic polyamine containing two primary or two secondary amino groups or one primary and one secondary amino group,

(B) a polyalkylenepolyamine of the formula



in which

R denotes H or CH_3, the indices y are in each case identical or different and denote the number 0 or 1 and

x denotes a number from 4 to 2,500,

or a mixture of such a polyalkylenepolyamine with an amine of the same formula,

but in which

x denotes a number from 1 to 3,

and

(C) a compound which is polyfunctional towards amino groups.

4,348,515

HEAT ACTIVATED THIURAM CONTAINING CURABLE COMPOSITIONS

Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Sep. 17, 1980, Ser. No. 187,874
Int. Cl.³ C08G 75/00; C08J 9/28; C08K 5/43
U.S. Cl. 526—204 6 Claims

1. A heat activated composition comprising

(1) an ethylenically unsaturated compound containing at least 2 carbon-to-carbon double bonds and

(2) a thiuram.

4,348,516

MICROBIOLOGICAL METHYLATION OF AMINOGLYCOSYL-AMINOGLYCOSIDES

Bong K. Lee; Gerald H. Wagman, both of East Brunswick; Dinanath F. Rane, Emerson; Joseph A. Marquez, Montclair, and Peter J. L. Daniels, Cedar Grove, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 51,790, Jun. 25, 1979, Pat. No. 4,234,685. This application Jun. 12, 1980, Ser. No. 158,850
Int. Cl.³ A61K 31/71; C07H 15/22
U.S. Cl. 536—10 8 Claims

1. A compound selected from the group consisting of (a) the 3″-N-methyl-4″-C-methyl analogs of tobramycin, kanamycin A, kanamycin B, and dibekacin, (b) the 5-epi, the 5-deoxy, 5-epiamino-5-deoxy, 5-epizido-5-deoxy and 5-epifluoro-5-deoxy analogs of 3″-N-methyl tobramycin, 3″-N-methyl-4″-C-methyl tobramycin, 3′-N-methyl kanamycin A, 3″-N-methyl-4″-C-methyl kanamycin B, 3″-N-methyl dibekacin, 3″-N-methyl-4″-C-methyl dibekacin and (c) the 1-N-X analogs of compounds of (a) and (b), wherein X is a (C_1–C_8) alkyl or a (C_1–C_8) acyl group which may bear substituents selected from the group consisting of amino, (C_1–C_8) lower alkylamino and hydroxy, with the proviso that not more than one substituent can be on the same carbon atom—and to the pharmaceutically acceptable non-toxic acid addition salts thereof.

4,348,517

PROCESS AND FINISH COMPOSITION FOR PRODUCING ADHESIVE ACTIVE POLYESTER YARN

Kalidas Chakravarti, Richmond, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 9, 1980, Ser. No. 214,554
Int. Cl.³ B05D 1/24, 1/38, 3/12; D06M 13/18
U.S. Cl. 523—425 28 Claims

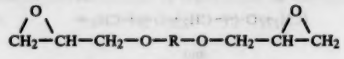
1. A fiber finish composition, comprising:

(a) about 50 to 79 weight percent of a solvent, and

(b) about 21 to 50 weight percent of an oil portion, comprising:

(1) about 6 to 36 weight percent of a triglycidyl ether of glycerol;

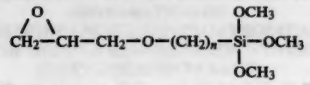
(2) about 6 to 22 weight percent of a diglycidyl ether having a Brookfield viscosity at 25° C. of 10 to 500 centipoises and having the structural formula



wherein R is alkylene or arylene;

(3) about 28 to 82 weight percent of ethoxylated castor oil; and

(4) about 6 to 22 weight percent of an epoxy silane having the structural formula



wherein n=2 to 5.

4,348,518

CEPHALOSPORINS

Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

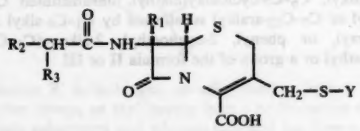
Division of Ser. No. 586,677, Jun. 13, 1975, Pat. No. 4,091,211. This application Jan. 30, 1978, Ser. No. 873,446

Claims priority, application Switzerland, May 5, 1974, 5743/75; May 29, 1974, 6915/75; Jun. 21, 1974, 8537/74

Int. Cl.³ C07D *501/36, 501/18*

U.S. Cl. 544—026 **13 Claims**

1. A compound of the formula:



wherein Y is a 5,6-dioxo-as-triazin-3-yl group where at least one nitrogen atom in said triazinyl group is substituted with a member selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, hydroxyl, lower alkoxy, amino, mono(lower alkyl)amino, di(lower alkyl)amino, formyl lower alkanoyl, lower alkanoylamino, carbamoyl, mono(lower alkyl)aminocarbonyl and di(lower alkyl-)aminocarbonyl; R_1 is hydrogen or methoxy, R_3 is hydrogen, hydroxy, hydroxymethyl, amino, azido, carboxy or sulfo; R_2 is cyano, or a substituent selected from the group consisting of pyridylthio, alkyl containing from 1 to 6 carbon atoms, alkenyl containing from 2 to 6 carbon atoms, saturated or unsaturated non-aromatic cyclic hydrocarbon containing from 3 to 6 carbon atoms, phenyl, phenylalkyl or phenoxyalkyl wherein said substituent can be unsubstituted or substituted with one or more members selected from the group consisting of hydroxy, halo, lower alkyl or lower alkoxy; with the proviso that when R_2 is pyridylthio, R_3 is hydrogen; and pharmaceutically acceptable salts thereof and hydrates thereof.

4,348,519

THIAZINE DERIVATIVES

Rudolf Pfister, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

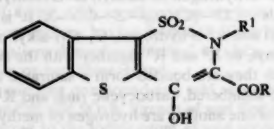
Filed May 16, 1980, Ser. No. 150,507

Claims priority, application Switzerland, Jun. 13, 1979, 5528/79; Mar. 25, 1980, 2325/80

Int. Cl.³ C07D *513/04*

U.S. Cl. 544—33 **6 Claims**

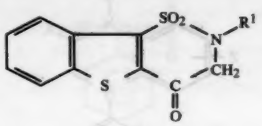
1. A compound of the formula



II

wherein R^1 is lower alkyl and R is a group of the formula $-NR^3R^4$ wherein R^3 and R^4 each is hydrogen or lower alkyl or together with the nitrogen atom is a 5-membered to 7-membered saturated heterocyclic group which can contain an oxygen atom.

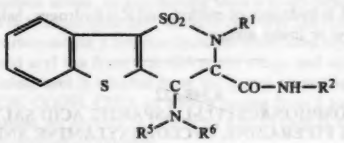
3. A compound of the formula



VI

wherein R^1 is lower alkyl.

5. A compound of the formula



VIII

wherein R^1 is lower alkyl and R^2 is 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazin-3-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl, 1,2,3,4-tetrazol-5-yl; phenyl; phenyl substituted by halogen, hydroxy, lower alkyl, trifluoromethyl, nitro or lower alkoxy; benzyl; or benzyl substituted by halogen, hydroxy, lower alkyl, trifluoromethyl, nitro or lower alkoxy; R^5 and R^6 each is lower alkyl or together with the nitrogen atom is pyrrolin-1-yl, pyrrolidin-1-yl, piperidino, morpholino or 4-(lower alkyl)-piperazin-1-yl.

4,348,520

METHOD FOR THE PREPARATION OF MELAMINE

Pierre G. M. B. Bruls, Born; Johannes G. van Hinsberg, Ulestraten; Rudolf van Hardeveld, Geleen, and Dominique J. J. S. M. Moreau, Sittard, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 2, 1980, Ser. No. 146,181

Claims priority, application Netherlands, May 3, 1979, 7903473

Int. Cl.³ C07D *251/60*

U.S. Cl. 544—201 **9 Claims**

1. In a method for the preparation of melamine comprising:

a reaction zone wherein melamine is formed by the conversion of urea and/or thermal decomposition products thereof in a fluidized bed of catalytically active material in the presence of a gas mixture containing ammonia and carbon dioxide, and

a desublimation zone wherein said melamine is desublimated from a melamine containing gas mixture by a dry-capture method leaving a desublimator off-gas mixture containing ammonia, carbon dioxide and gaseous impurities,

the improvement wherein at least a major portion of said desublimator off-gas mixture is compressed and recirculated to said reaction zone as fluidizing gas for the bed of catalytically active material, without intervening treatment to remove said gaseous impurities.

4,348,521

SUBSTITUTED PYRIDOQUINOXALINE-6-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

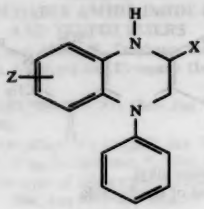
John F. Gerster, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 16, 1981, Ser. No. 254,973

Int. Cl.³ C07D *241/06, 487/06, 487/16, 31/495*

U.S. Cl. 544—353 **1 Claim**

1. A compound of the formula



wherein X is hydrogen or methyl; and Z is hydrogen, halogen, lower alkyl or lower alkoxy.

4,348,522

N-(PHOSPHONACETYL)-L-ASPARTIC ACID SALTS WITH PIPERAZINE, CYCLOHEXYLAMINE AND CALCIUM

Robert J. Schultz, Amherst, and Fred W. Starks, Kenmore, both of N.Y., assignors to Starks Associates, Inc., Buffalo, N.Y.

Division of Ser. No. 114,624, Jan. 23, 1980, Pat. No. 4,267,126, which is a division of Ser. No. 954,579, Oct. 25, 1978, Pat. No. 4,215,070, which is a continuation-in-part of Ser. No. 932,501, Aug. 10, 1978, Pat. No. 4,179,464, which is a continuation-in-part of Ser. No. 851,382, Nov. 14, 1977, abandoned. This application May 8, 1981, Ser. No. 261,915

Int. Cl.³ C07D *295/00*

U.S. Cl. 544—358 **4 Claims**

1. A salt of N-(phosphonoacetyl)-L-aspartic acid selected from the group consisting of:

(a) the calcium salt;

(b) the piperazine salt; or

(c) the cyclohexylamine salt.

4,348,523

PREPARATION OF THIONAMIDE COMPOUNDS BY SULFURATION OF IMINES

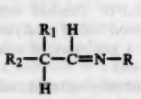
Theodore C. Shields, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 8, 1980, Ser. No. 184,924

Int. Cl.³ C07D *295/10*; C07C *155/02*

U.S. Cl. 544—399 **17 Claims**

1. A method of making thionamides comprising reacting an imine having the structural formula:



where R is an alkyl group, other than a cyclohexyl group, of 1 to 18 carbon atoms, R_1 and R_2 are each phenyl groups or alkyl groups of 1 to 18 carbon atoms, and the sum of the carbon atoms in R_1, and R_2 is less than 36, with free sulfur in the presence of an immiscible polyol compound.

4,348,524

AMIDE DERIVATIVES OF POLYALKYLPIPERIDINES

Friedrich Karrer, Zofingen, and Paul Moser, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

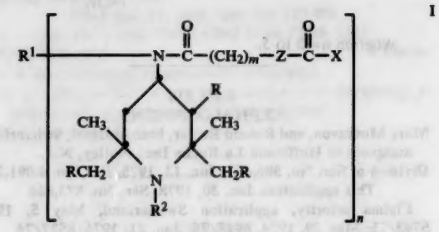
Filed Mar. 17, 1981, Ser. No. 244,551

Claims priority, application Switzerland, Mar. 28, 1980, 2493/80

Int. Cl.³ C07D *211/58*

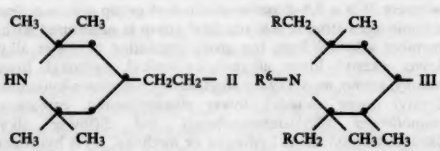
U.S. Cl. 546—187 **7 Claims**

1. A compound of the formula I



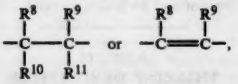
I

in which m is 0 or 1 and n is 1 or 2, X is —OH, —OR^3 or —$N(R^4)(R^5)$, R is hydrogen or CH_3, R^1, if n is 1, is C_1–C_{18}-alkyl, C_2–C_4-hydroxyalkyl, C_3–C_5-methoxyalkyl, C_5–C_8-cycloalkyl, C_6–C_7-cycloalkylmethyl, unsubstituted C_7–C_{12}-aralkyl or C_7–C_{12}-aralkyl substituted by C_1–C_4-alkyl and/or hydroxyl, or phenyl, 2-cyanoethyl, 2-alkoxy(C_1–C_4)-carbonylethyl or a group of the formula II or III



II III

and if n is 2 is C_2–C_{12}-alkylene, C_2–C_{12}-alkylene interrupted by one or more —O— or —$N(R^7)$— or C_6–C_{18}-cycloalkylene, R^2 is hydrogen, an oxyl radical, C_1–C_{12}-alkyl, C_2–C_4-hydroxyalkyl, C_3–C_5-alkenyl, propargyl, benzyl or acetyl, Z is a group



R^3 is C_1–C_{12}-alkyl, C_2–C_4-hydroxyalkyl, C_3–C_{10}-alkoxyalkyl, C_3–C_5-alkenyl, benzyl, cyclohexyl or a radical of the formula III, R^4 is hydrogen, C_1–C_{12}-alkyl, C_3–C_5-alkenyl, benzyl or cyclohexyl and R^5 is hydrogen, C_1–C_{12}-alkyl, allyl, C_2–C_4-hydroxyalkyl, cyclohexyl or a radical of the formula III, or R^4 and R^5 together with the N atom to which they are bonded form a pyrrolidine, piperidine, hexamethyleneimine or morpholine ring, R^6 is hydrogen or methyl, R^7 is methyl or one of the acyl radicals —CO—$(CH_2)_m$—Z—CO—X, R^8 is hydrogen or C_1–C_{18}-alkyl and R^9 is hydrogen, C_1–C_{18}-alkyl or C_3–C_{12}-alkenyl or phenyl, or R^8 and R^9 together with the two carbon atoms to which they are bonded form a saturated or unsaturated, at least 5-membered, carbocyclic ring, and R^{10} and R^{11} independently of one another are hydrogen or methyl, or a salt of such a compound with a mineral acid, sulfonic acid or organic phosphoric acid, or a salt of a compound of the formula I in which X is —OH with a monovalent to trivalent metal.

7. A compound according to claim 1, of the formula I, in which X is —OH or —OR^3 and R^3 is alkyl, allyl or benzyl.

4,348,525

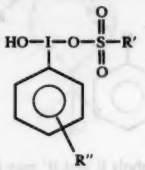
COMPOSITION AND A PROCESS FOR THE PREPARATION OF [HYDROXY(ORGANOSULFONYLOXY)IODO]ARENES AND THEIR USE IN A REGIOSPECIFIC SYNTHESIS OF DIARYLIODONIUM SALTS

Gerald F. Koser, Munroe Falls, and Richard H. Wettach, Toledo, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Apr. 9, 1981, Ser. No. 252,455
Int. Cl.³ C07D 213/26; C07C 65/01, 139/00
U.S. Cl. 546—346 38 Claims

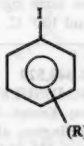
1. A process for preparing a [hydroxy(organosulfonyloxy)iodo]arene compound, comprising the steps of:

obtaining a first compound having the formula



wherein R′ is hydrogen, an alkyl having from 1 to 20 carbon atoms, an aryl having from 6 to 40 carbon atoms, a halo substituted aryl wherein said aryl has from 6 to 40 carbon atoms; a heterosubstituent substituted aryl wherein said aryl has from 6 to 40 carbon atoms and said heterosubstituent is selected from the group consisting of NO_2, CN, COOH, CHO, an alkoxy having from 1 to 6 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof;

wherein R″ is hydrogen or an ortho, meta, or para alkyl having from 1 to 5 carbon atoms; obtaining a second compound having the formula

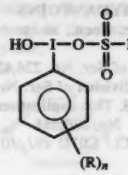


wherein n is from 0 to 5, wherein said $(R)_n$ groups are the same or different, wherein R is benzo, a halo group, an alkyl group having from 1 to 20 carbon atoms, a cycloalkyl group having from 3 to 20 carbon atoms, an aryl group having from 6 to 40 carbon atoms, a halo substituted aryl group wherein said aryl has from 6 to 40 carbon atoms, an alpha or beta naphthyl, a halo substituted alpha or beta naphthyl, a 3 to 20 carbon atom cycle alkyl substituted alpha or beta naphthyl, an alpha or beta alkyl substituted naphthyl wherein said alkyl has from 1 to 20 carbon atoms; a heterosubstituent substituted aryl wherein said aryl has from 6 to 40 carbon atoms, and said heterosubstituent is selected from the group consisting of CN, NO_2, COOH, CHO, OH, an alkoxy having from 1 to 5 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof; a pyridinyl, an alpha or beta furyl or an alpha or beta thienyl; and

reacting said first compound and said second compound so that the OH and SO_3R' ligands of said first compound are transferred to the iodine atom of said second compound, thereby forming the [hydroxy(organosulfonyloxy)iodo]arene compound.

11. A process for preparing a diaryliodonium salt, comprising the steps of:

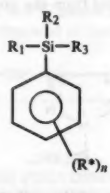
obtaining a compound having the formula



wherein R′ is hydrogen, an alkyl having from 1 to 20 carbon atoms, an aryl having from 6 to 40 carbon atoms, a halo substituted aryl wherein said aryl has from 6 to 40 carbon atoms; a heterosubstituent substituted aryl wherein said aryl has from 6 to 40 carbon atoms and said heterosubstituent is selected from the group consisting of NO_2, CN, COOH, CHO, an alkoxy having from 1 to 6 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof;

where n of R_n is from 0 to 5, wherein the R groups are the same or different, and wherein R is benzo, a halo group, an alkyl group having from 1 to 20 carbon atoms, a cycloalkyl group having from 3 to 20 carbon atoms, an aryl group having from 6 to 40 carbon atoms, a halo substituted aryl group wherein said aryl has from 6 to 40 carbon atoms, an alpha or beta naphthyl, a halo substituted alpha or beta naphthyl, a 3 to 20 carbon atom cycloalkyl substituted alpha or beta naphthyl, an alkyl substituted alpha or beta naphthyl wherein said alkyl has from 1 to 20 carbon atoms; a heterosubstituent substituted aryl wherein said aryl has from 6 to 40 carbon atoms, and said heterosubstituent is selected from the group consisting of CN, NO_2, COOH, CHO, OH, an alkoxy having from 1 to 5 carbon atoms, an aryloxy having from 6 to 30 carbon atoms, and combinations thereof; a pyridinyl, an alpha or beta furyl or an alpha or beta thienyl;

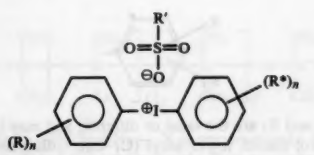
obtaining a compound having the formula



where R_1, R_2, and R_3 are the same or different, wherein R_1, R_2, and R_3 are hydrogen, an alkyl having from 1 to 5 carbon atoms, a halo group, an aryl group having from 6 to 24 atoms, or an alkoxy group having from 1 to 5 carbon atoms;

wherein n of said $(R^*)_n$ is from 1 to 5, wherein R* can be the same or different, and wherein R* is defined by R, and

reacting said compounds and producing a diaryliodonium salt having the formula



wherein R′, $(R)_n$, and $(R^*)_n$ are as set forth herein.

4,348,526

INTERMEDIATES IN THE PREPARATION OF CHIRAL HYDANTOINS

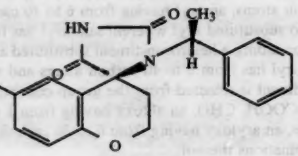
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 226,434, Jan. 19, 1981, abandoned, which is a division of Ser. No. 135,137, Mar. 28, 1980, Pat. No. 4,286,098. This application Nov. 12, 1981, Ser. No. 320,051

Int. Cl.³ C07D *491/107*

U.S. Cl. 548—309 9 Claims

1. A compound of the formula



wherein X is chloro or fluoro.

4,348,527

3-TRIFLUOROACETYL AMINO-1-ARYL-2-PYRAZOLINES

John P. Dusza, Nanuet, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

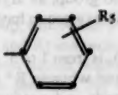
Filed Jul. 13, 1981, Ser. No. 282,972

Int. Cl.³ C07D *231/06*

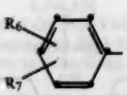
U.S. Cl. 548—362 15 Claims

1. A compound selected from the group consisting of those of the formula:

wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is hydrogen, lower alkyl (C_1–C_4), phenyl or



where R_5 is halogen; R_3 is



where R_6 and R_7 are the same or different and may be hydrogen, chloro, fluoro, lower alkyl (C_1–C_4), trifluoromethyl or $COCF_3$; R_4 is —$COCF_3$; and the pharmacologically acceptable acid-addition salts thereof.

4,348,528

PROCESS FOR THE PREPARATION OF 1-PHENYL-3-CARBAMOYL-5-PYRAZOLONES

Antoine G. L. J. Breda, Craponne, and Jacques G. R. Roussel, Bosc Roger en Roumois, both of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

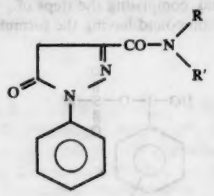
Filed Jul. 13, 1981, Ser. No. 282,903

Claims priority, application France, Jul. 18, 1980, 80 15878

Int. Cl.³ C07D *231/22*

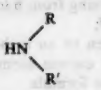
U.S. Cl. 548—367 4 Claims

1. A process for the preparation of a 1-phenyl-3-carbamoyl-5-pyrazolone of the formula:



(I)

in which the two symbols R and R′ may be the same or different and each represents a hydrogen atom, an alkyl radical or substiuted alkyl radical containing 1 to 4 carbon atoms in which an aqueous paste of diethyl oxalacetate phenylhydrazone is heated at a temperature not greater than 85° C. until the hydrazone is completely melted, then the aqueous phase is removed and the remaining hydrazone is treated with 2 to 12 molar equivalents of a compound of the formula:



(IV)

wherein R and R′ have the same significance as above, at a temperature between 20° and 100° C.

4,348,529

SYNTHESIS OF CYCLIC DISULFONE COMPOUNDS

Alan L. Borror, Lexington; Ernest W. Ellis, Carlisle, and Charles E. Hammond, Burlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 19, 1981, Ser. No. 294,408

Int. Cl.³ C07D *339/00, 339/06, 339/08*

U.S. Cl. 549—22 8 Claims

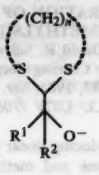
1. A method of synthesizing bis-sulfones which comprises

(a) reacting a 1,3-dithio compound,

wherein n is an integer 2, 3 or 4 with n-butyllithium in tetrahydrofuran to generate the anion of said 1,3-dithio compound;

(b) adding to said anion a carbonyl compound

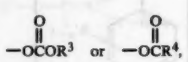
wherein R^1 and R^2 each are hydrogen, alkyl, phenalkyl, phenyl or phenyl-substituted with an electron-donating group or an electron-withdrawing group to give the 2-substituted carbonol anion intermediate:



wherein R^1, R^2 and n have the same meaning given above;

(c) reacting said intermediate with a chloroformate or acyl chloride to give the corresponding ester:

wherein Z is



R^3 is benzyl or ethyl; R^4 is methyl or phenyl; and R^1, R^2 and n have the same meaning given above; and

(d) reacting said ester with a peracid to give the bis-sulfone having the formula

wherein R^1, R^2 and n have the same meaning given above.

4,348,530

THIOXANTHONECARBOXYLIC ACIDS, ESTERS, THIOESTERS AND AMIDES WITH REACTIVE FUNCTIONAL GROUPS

Vratislav Kvita, Reinach; Hans Zweifel, Basel; Martin Roth, Marly, and Louis Felder, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

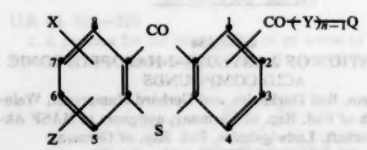
Filed Jan. 26, 1981, Ser. No. 228,533

Claims priority, application Switzerland, Feb. 5, 1980, 917/80

Int. Cl.³ C07D *335/16*

U.S. Cl. 549—27 **6 Claims**

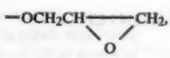
1. A compound of the formula I



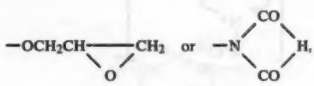
(I)

in which n is the number 1 or 2, X is hydrogen, halogen, —CN, —OH, —SH, —NO_2, —NH_2, phenylsulfonyl or alkylsulfonyl, alkyl, alkoxy, alkylthio, N,N-dialkylamino or —CO-alkyl having, in each case, 1–4 C atoms in the alkyl moieties, Z is hydrogen, halogen, —OH, —SH or alkyl, alkoxy, alkylthio or N,N-dialkylamino having, in each case, 1–4 C atoms in the alkyl moieties, Y is —OR_1—, —SR_1— or —$N(R_2)R_1$—, R_1 is straight-chain or branched alkylene having a total of 2–23 C atoms and 2–13 C atoms in the main chain, cyclopentylene, cyclohexylene, phenylene,

or, if n is 2 and Q is —OH or —OCO—C(R″)=CH_2, also —$(CH_2CH_2O)_x$—CH_2CH_2—, R_2 is hydrogen or straight-chain or branched alkyl having a total of 1–23 C atoms and 1–13 C atoms in the main chain, G is —CH_2—, —CH_2CH_2—, —$C(CH_3)_2$—, —O—, —SO_2— or —NH—, x is an integer from 1 to 5, Q is



—OCH_2—COOH, —OCH=CH_2, —OCH_2CH=CH_2, —SCH_2CH=CH_2 or —$NHCH_2CH$=CH_2 if n is 1, and is —OH, —SH, —NH_2, —NHR′, —SO_3H, —COOH, —COCl, —NCO, —OCO—C(R″)=CH_2, —SCO—C(R″)=CH_2, —NHCO—C(R″)=CH_2, —OCH=CH_2,



if n is 2, or is also —CH=CH_2 if R_1 is alkylene or phenylene, and R′ is alkyl having 1–5 C atoms and R″ is hydrogen or methyl, or a salt of a compound of the formula I in which Q is —NH_2 or —NHR′.

4,348,531

FLUOROSILICONE POLYDIMETHYLSILOXANE EQUILIBRATION CHAINSTOPPER AND PROCESS FOR MANUFACTURE

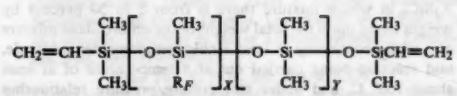
Edwin R. Evans, Saratoga, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 71,152, Aug. 30, 1979, abandoned. This application Apr. 1, 1981, Ser. No. 249,785

Int. Cl.³ C07F *7/02*

U.S. Cl. 556—453 **4 Claims**

1. A fluorosilicone polydimethylsiloxane equilibration chainstopper composition having an empirical formula as follows:



wherein R_F is $CF_3CH_2CH_2$—, X is approximately 10 to approximately 30 and Y is approximately 20 to approximately 50, and having a viscosity of, approximately, 30 to 70 centipoise at 25° C. and a density of, approximately, 1.09 to 1.130.

4,348,532

MONOORGANOSILOXY CONTAINING SILOXANE FLUIDS

Allan M. Alanko; Ollie W. Marko; Charles E. Skinner, all of Carrollton, and Larry H. Wood, Campbellsburg, all of Ky., assignors to Dow Corning Corporation, Midland, Mich.

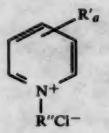
Filed Oct. 5, 1981, Ser. No. 308,341

Int. Cl.³ C07F 7/08, 7/18

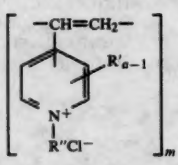
U.S. Cl. 556—457 **5 Claims**

1. In a method for preparing siloxanes and methyl chloride by reacting methanol with chlorosilanes in contact with a quaternary ammonium catalyst of the group consisting of:

(1) pyridinium chlorides of the formula

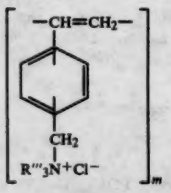


(2) compounds of the formula $R'''_4N^+Cl^-$,



(3)

and



(4)

where R' is a hydrocarbon radical having 18 or less carbon atoms; "a" is an integer from 0–5; "m" is an integer greater than 1, R'' is a lower alkyl radical; and R''' is selected from the group consisting of methyl, hydroxy alkyl of 2–4 inclusive carbon atoms, aromatic hydrocarbon radicals, and $ArCH_2$— radicals in which Ar is an aromatic hydrocarbon radical there being no more than 18 carbon atoms total in the R''' group,

the improvement comprising employing as the chlorosilanes a mixture of R_2SiCl_2 and a silane (A) selected from the group consisting of $RSiCl_3$ and $R_nCl_{3-n}SiSiR_{n'}Cl_{3-n'}$ and optionally R_3SiCl in which mixture there is from 2 to 50 percent by weight based upon the total weight of the chlorosilane mixture of a silane containing at least 3 chlorine atoms per molecule, said reaction being carried out at a temperature of at least about 100° C. and under temperature/pressure relationship such that water escapes from the reaction zone, whereby stable polysiloxane fluids are obtained, in said silanes R is methyl, ethyl, 3-chloropropyl, or 3,3,3-trifluoropropyl and n and n' are each integers from 0 to 2, the total value of n and n' being from 1 to 3.

4,348,533

PREPARATION OF LINEAR POLYDIMETHYLSILOXANES

Allan M. Alanko, and David R. Salverson, both of Carrollton, Ky., assignors to Dow Corning Corporation, Midland, Mich.

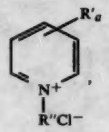
Filed Oct. 13, 1981, Ser. No. 310,546

Int. Cl.³ C07F 7/08, 7/18

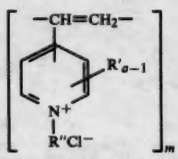
U.S. Cl. 556—457 **4 Claims**

1. In a method of producing linear polysiloxanes by reaction of dimethyldichlorosilane and methanol in contact with a catalyst selected from the group consisting of

(1) pyridinium chlorides of the formula

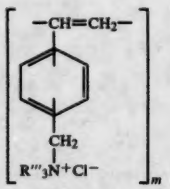


(2) compounds of the formula $R'''_4N^+Cl^-$,



(3)

and



(4)

where R' is a hydrocarbon radical having 18 or less carbon atoms; "a" is an integer from 0–5; "m" is an integer greater than 1, R'' is a lower alkyl radical; and R''' is selected from the group consisting of methyl, hydroxy alkyl of 2–4 inclusive carbon atoms, aromatic hydrocarbon radicals, and $ArCH_2$— radicals in which Ar is an aromatic hydrocarbon radical there being no more than 18 carbon atoms total in the R''' group,

the improvement comprising carrying out the reaction at a pressure of from 15 to 100 psi at a temperature of from 130° to 170° C. and thereafter separating the dimethylpolysiloxane so produced from the catalyst.

4,348,534

PREPARATION OF 2-ARYLOXY-2-HALOPROPTONIC ACID COMPOUNDS

Gerd Husslein, Bad Durkheim, and Gerhard Hamprecht, Weinheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

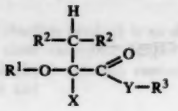
Filed Jun. 17, 1981, Ser. No. 274,493

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028625

Int. Cl.³ C07C 69/76

U.S. Cl. 560—62 **8 Claims**

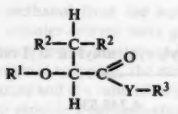
1. A process for the preparation of 2-aryloxy-2-halopropionic acid compounds of the formula



I

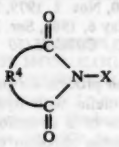
where Y is oxygen or

R^1 is an aromatic radical, the R^2's and R^3's can be identical or different and each is hydrogen or an aliphatic or cycloaliphatic radical, and R^3 can also be araliphatic or aromatic radical, and X is chlorine or bromine, by reacting a 2-aryloxypropionic acid compound with an N-halocarboxylic acid imide in the presence of an organic solvent, wherein a 2-aryloxypropionic acid compound of the formula



II

where R^1, R^2, R^3 and Y have the above meanings, is reacted with an N-halocarboxylic acid imide of the formula



III

where X has the above meanings and R^4 is an aliphatic radical, in the presence of an aliphatic halohydrocarbon as the solvent and of from 0.0001 to 0.001 mole of halogen per mole of starting material III, from 0.005 to 0.05 percent by weight of water, based on starting material III, and from 0.0005 to 0.005 mole of azo-bis-isobutyronitrile and/or dibenzoyl peroxide per mole of starting material III.

4,348,535

SUBSTITUTED LACTONES AND PROCESSES FOR THEIR PREPARATION

Hans-Georg Schmidt, Niederkassel, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

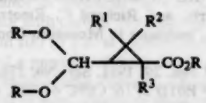
Filed Dec. 19, 1980, Ser. No. 218,593

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952068; Dec. 3, 1980, 3045455; Dec. 6, 1980, 3046059

Int. Cl.³ C07C *69/743*

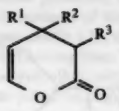
U.S. Cl. 560—124 **5 Claims**

1. A process for the preparation of an acetal of 2,2-dialkyl-3-formyl-cyclopropane carboxylic acid ester of the formula



wherein each R is a C_1 to C_4 alkyl group, R^1, R^2 and R^3 are hydrogen or C_1 to C_{10} alkyl which comprises:

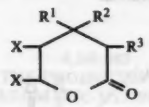
A. contacting the unsubstituted lactone of the formula



(VI)

wherein

R^1, R^2 and R^3 have the meaning stated above with chlorine or bromine to form a dihalo compound of the formula



(IV)

wherein

X is chlorine or bromine; contacting the resultant dihalo lactone with an alcoholate of the formula

M—OR

wherein

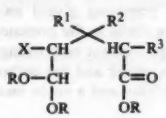
M is alkali metal and

R is an alkyl group of 1 to 4 carbon atoms in the presence of an alcohol of the formula

R—OH

wherein

R is a C_1 to C_4 alkyl group to form an acetal of of the formula



(V)

wherein R^1, R^2 and R^3 have the meaning given above; and contacting the resultant acetal with an alcoholate of the formula MOR wherein M and R have the meaning given above whereby to effect cyclization of the acetal and formation of the acetal of 2,2-dialkyl-3-formyl-cyclopropane carboxylic acid alkyl ester.

4,348,536

ODORLESS CATALYSTS FOR THE SYNTHESIS OF POLYURETHANES

Johannes Blahak, Cologne; Hans Hübner, Katzenellenbogen; Johannes Koster, Dormagen; Hans J. Meiners, Leverkusen-Schlebusch, and Heinz Thomas, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

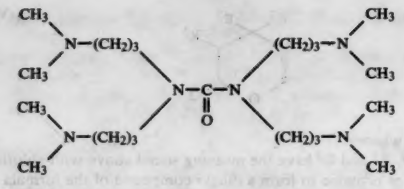
Filed Feb. 6, 1978, Ser. No. 875,278

Claims priority, application Fed. Rep. of Germany, May 28, 1975, 2523633

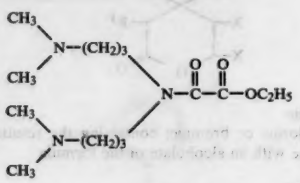
Int. Cl.³ C07C *127/15, 103/44*

U.S. Cl. 560—169 **2 Claims**

1. Compound of the formula:



2. Compound of the formula:



4,348,537

OLEFIN OXIDATION

Joon T. Kwon, Freehold Township, Monmouth County, and Abraham P. Gelbein, Morristown, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jun. 8, 1981, Ser. No. 271,793

Int. Cl.³ C07C *67/055*

U.S. Cl. 560—243 **14 Claims**

1. In a process for preparing glycol mono- and diesters comprising oxidizing an olefin in the presence of a carboxylic acid and water, the improvement comprising:

contacting the olefin, water and the carboxylic acid in the presence of Mn(IV) ion and a noble metal.

4,348,538

PREPARATION OF 3-BROMO-4-FLUORO-BENZALDEHYDE ACETALS AND INTERMEDIATES THEREFOR

Fritz Maurer, Wuppertal; Uwe Priesnitz, Solingen; Hans-Jochem Riebel; Bernd Gallenkamp, both of Wuppertal, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

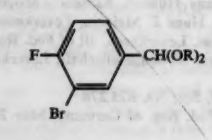
Filed Sep. 16, 1981, Ser. No. 302,913

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035921

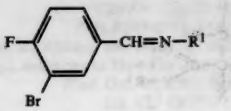
Int. Cl.³ C07C *59/153, 43/313, 119/10, 121/76*

U.S. Cl. 562—459 **18 Claims**

1. A process for the preparation of a 3-bromo-4-fluoro-benzaldehyde acetal of the formula:



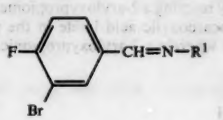
in which R each independently is a C_1 to C_4 alkyl group or the radicals R together are a C_2 to C_5 alkanediyl radical, comprising reacting a 3-bromo-4-fluoro-benzaldimine of the formula:



in which R^1 is an alkyl, cycloalkyl or aryl radical, with an alcohol or alkanediol of the formula:

in which n is 1 or 2, in the presence of sulphuric acid at a temperature between about 0° and 100° C.

8. A 3-bromo-4-fluoro-benzaldimine of the formula:



in which R^1 is an alkyl, cycloalkyl or aryl radical.

4,348,539

HETERONUCLEAR-BRIDGED RHODIUM CLUSTERS

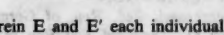
Ernst Billig; Jackie D. Jamerson, both of Charleston, W. Va., and Roy L. Pruett, New Providence, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 90,140, Nov. 1, 1979, Pat. No. 4,288,380. This application May 6, 1981, Ser. No. 260,920

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **11 Claims**

1. In a hydroformylation process for producing aldehydes by hydroformylating an olefin with hydrogen and carbon monoxide in the presence of a hydroformylation reaction medium comprising a soluble rhodium complex catalyst, a solvent for said catalyst, and at least 2 moles of a free triorgano Group VA element ligand, wherein the reaction conditions consist essentially of (1) a temperature in the range of from about 50° to about 200° C., (2) a total gas pressure of hydrogen, carbon monoxide and olefin of less than about 1500 psia., (3) a carbon monoxide partial pressure of less than about 300 psia. and (4) a hydrogen partial pressure of less than 400 psia., the improvement comprising employing as the catalyst for said process a catalytic amount of a heteronuclear-bridged rhodium cluster compound having the generic formula



wherein E and E' each individually represent a Group VA element selected from the group consisting of phosphorus, arsenic or antimony; wherein R and R' each individually represent a monovalent organic radical selected from the group consisting of alkyl, aryl, alkoxy and aryloxy radicals; wherein f has a value of from 2 to 6, m has a value of from 1 to 6, p has a value of from 1 to 6 and q has a value of from 1 to 6.

4,348,540

MANUFACTURE OF AQUEOUS FORMALDEHYDE

Theodore V. Ferris, and Richard C. Kmetz, both of Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 29, 1981, Ser. No. 278,811

Int. Cl.³ B01D *3/16*; C07C *47/055, 47/058*

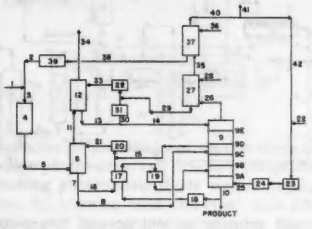
U.S. Cl. 568—472 **19 Claims**

1. A process for the manufacture of an aqueous solution of formaldehyde comprising the steps of:

(a) oxidatively dehydrogenating methanol with air in the pres-

ence of a silver or copper catalyst and steam at elevated temperature;

(b) absorbing the reaction product in an absorption train comprising one or more absorption stages in series to form an aqueous formaldehyde solution containing free and combined methanol; and



(c) stripping the methanol from the aqueous formaldehyde solution with a counter-current inert gas stream in a stripping column comprising at least about 1.5 theoretical transfer units for methanol stripping, the stripping being carried out at a temperature and at a ratio of stripping gas to aqueous formaldehyde to provide a concentration of vapors of aqueous methanolic formaldehyde in the gas emerging from the stripping column of no more than about 50 mol percent.

4,348,541

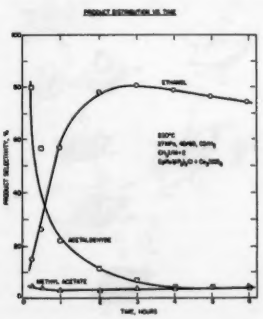
METHANOL HOMOLOGATION USING COBALT-RUTHENIUM CATALYSTS

Gerald Doyle, Bridgewater, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 30, 1979, Ser. No. 98,981

Int. Cl.³ C07C *47/06, 29/00, 27/00, 45/49*

U.S. Cl. 568—487 **16 Claims**



1. A process for the homogeneous conversion of methanol to acetaldehyde, ethanol or mixtures thereof which comprises contacting methanol with carbon monoxide and hydrogen in a $CO:H_2$ ratio of from 10:1 to 1:10 at a temperature of from about 100° to 300° C. and a pressure of from about 2 to 100 MPa in the presence of a catalytically effective amount of a catalyst system, said catalyst system consisting essentially of:

(a) cobalt-ruthenium complexes selected from the group consisting of $HRuCo_3(CO)_{12}$, $M[RuCo_3(CO)_{12}]$, $HCoRu_3(CO)_{13}$, $M[CoRu_3(CO)_{13}]$ and $C_5H_5Ru(P\phi_3)_2Co(CO)_4$ where M is a cation;

(b) an iodine or iodide promoter; and

(c) a phosphorus compound of the formula PR_3 or $P(OR)_3$ where R is independently a C_1 to C_{20} aliphatic radical, C_6 to C_{10} aryl, aralkyl having from 1 to 6 carbon atoms in the alkyl or C_3 to C_8 cycloalkyl, with the proviso that if either the ruthenium or cobalt in component (a) bears a PR_3 or $P(OR)_3$ ligand, component (c) may be omitted.

4,348,542

PROCESS FOR THE PRODUCTION OF MIXTURES OF ALKYLATED AROMATIC HYDROXY COMPOUNDS

Volker Serini; Rainer Neumann; Gerhard Friedhofen; Dieter Freitag; Jürgen Heuser, and Hans-Helmut Schwarz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,376

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928443

Int. Cl.³ C07C *39/12*

U.S. Cl. 568—727 **3 Claims**

1. A process for producing a mixture of alkylated aromatic polyhydroxy compounds suitable for the direct production of high molecular weight thermoplastic polycarbonates which comprise reacting commercial 2,6-dialkyl phenol containing 98 to 70% of 2,6-dialkyl phenol, 2 to 30% of monoalkyl phenol, about 0.1 to 5% of phenol and about 0.1 to 2% of an at least trialkylated phenol with a carbonyl compound in the presence of a catalytic amount of an acidic organic ion exchanger and recycling into the reaction unreacted commercial 2,6-dialkyl phenol without intermediate purification.

4,348,543

CYCLOALIPHATIC ALCOHOLS

Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

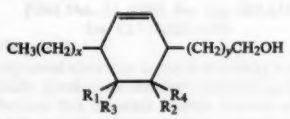
Filed Feb. 12, 1981, Ser. No. 233,793

Int. Cl.³ C07C *35/18, 35/14*

U.S. Cl. 568—823 **10 Claims**

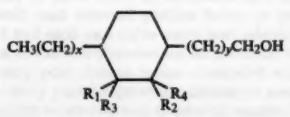
1. A cycloaliphatic alcohol which is a member selected from the group consisting of

I



and

II



and mixtures thereof wherein R_1 and R_2 are selected from the group consisting of hydrogen and methyl and mixtures thereof with the provision that one such member must be hydrogen; and R_3 and R_4 are hydrogen or hydroxymethyl provided that at least one but not both of R_3 and R_4 must be hydroxymethyl;

and further that x is an integer of from 3 through 6 and y is an integer from 6 through 9 and that the sum x plus y is 12.

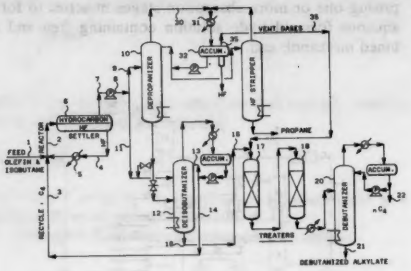
4,348,544

RECOVERY OF PROPANE FROM HF ALKYLATION VENT GAS

Edgar D. Davis, and David J. Cones, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 14, 1979, Ser. No. 75,393
Int. Cl.³ C07C 7/00, 2/56
U.S. Cl. 585—300 **4 Claims**

1. A process for improved recovery of HF and propane contained in vent gases resulting from an alkylation of hydrocarbons in the presence of HF under conditions to produce an alkylation effluent from which an alkylate product is recovered by fractionation thus producing an alkylate-containing stream which is treated to remove therefrom HF and a normal butane-containing stream which is recovered downstream of said treatment, which comprises introducing said vent gases into a stream in said fractionation prior to said treatment, thus



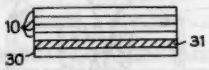
recovering said propane in said normal butane-containing stream.

4,348,545

PROCESS FOR MOUNTING A PROTECTION DIODE ON A VERTICAL MULTIJUNCTION PHOTOVOLTAIC CELL STRUCTURE AND PHOTOVOLTAIC CELLS OBTAINED

Jacques Arnould, Paris, France, assignor to Le Silicium Semiconducteur SSC, Paris, France

Filed Jan. 28, 1981, Ser. No. 229,262
Claims priority, application France, Feb. 1, 1980, 80 02253
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—244 12 Claims



1. In a process for mounting a protection diode on a vertical multijunction photovoltaic cell structure comprising the steps of (a) stacking photovoltaic diode wafers having the same orientation, (b) securing them firmly to each other and (c) cutting them into bars perpendicular to the direction of the wafers, the improvement comprising essentially and in combination with steps (a), (b) and (c), before the cutting step, the additional steps of (b') disposing on the stack a diode wafer having the reverse polarity of that of the other diodes and (b") securing this diode to the stack.

5. An integrated photovoltaic cell of the vertical multijunction type in the form of a bar comprising:

a photovoltaic diode stack, and

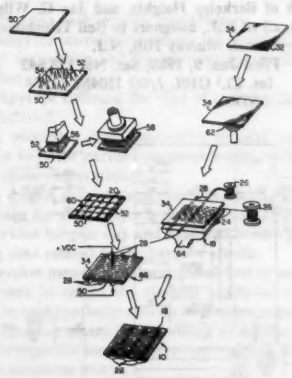
a reversely connected diode integral with the other diodes.

4,348,546

FRONT SURFACE METALLIZATION AND ENCAPSULATION OF SOLAR CELLS

Roger G. Little, Bedford, Mass., assignor to Spire Corporation, Bedford, Mass.

Continuation of Ser. No. 181,106, Aug. 25, 1980, abandoned.
This application Oct. 13, 1981, Ser. No. 310,793
Int. Cl.³ H01L 31/06
U.S. Cl. 136—256 3 Claims



1. In a solar cell of the type comprising inner front and rear semiconductor strata for generating a photovoltaic effect in response to incident solar radiation and outer front and rear conducting strata constituting electrical contacts, wherein the front conducting stratum is a metallic grid that permits transmission of solar radiation to the semiconductor strata:

(a) the improvement in which said metallic grid is in the form of a mesh of fine wires formed of a first metal coated with a second metal, one of said metals including a highly conductive member of the group consisting of silver and copper and the other of said metals having a sufficiently high tensile strength to be self-supporting while being drawn into contact with one or more components of said solar cell before completion of said cell's fabrication;

(b) said metallic grid further including at least one conductive bus in the form of a metallic strip of sufficiently high tensile strength to be self-supporting while said bus is drawn into contact with one or more components of said solar cell and connected electrically to said mesh of wires and extended beyond the edge of said solar cell for electrical connection to a rear conducting stratum of an adjacent solar cell in order to facilitate the fabrication of a solar module;

(c) said mesh of wires extending in one direction and having a rectangular cross section and said metallic strip extending transversely to said mesh of wires and also having a rectangular cross section;

(d) said solar cell further including a transparent cover plate having an outer and an inner surface, said mesh of wires being interposed between said inner surface of said plate and the exposed surface of said front semiconductor stratum, said inner surface of said plate electrostatically bonded to said front semiconductor stratum, with said mesh of wires encapsulated therebetween;

(e) said transparent cover plate having an antireflective coating on its said inner surface, with said mesh of wires being pressed into the softened inner surface of said plate and said plate electrostatically bonded to the exposed surface of said front semiconductor stratum, with said mesh of wires encapsulated therebetween;

(f) said cover plate forming a permanent hermetic seal about said front semiconductor stratum during its said electrostatic bonding thereto, said hermetic seal preventing oxidation of said mesh of wires, and assuring thereby the preservation of the electrical contact formed between said mesh of wires and said front semiconductor stratum during said electrostatic bonding between said plate and said front semiconductor stratum;

(g) said electrostatic bonding effected between said plate and said front semiconductor stratum permanently entrapping said mesh of wires in said electrical contact with said front semiconductor stratum, said electrical contact being in the nature of a thermocompression bond between said mesh and said semiconductor stratum;

(h) said mesh of wires being characterized in having a wire spacing of about eight wires per centimeter, with said wires having an original diameter range prior to said electrostatic bonding of from about ten to about fifty microns.

4,348,547

ELECTRICAL OUTLET BOX WITH RECESSED PORTS

Wade R. Bowden, Jr., Northport, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Oct. 24, 1980, Ser. No. 200,423
Int. Cl.³ H02G 3/08
U.S. Cl. 174—65 R 17 Claims

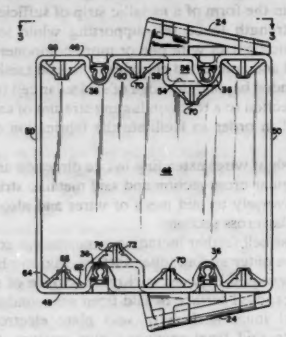
1. An improved electrical outlet box having a backwall and an essentially continuous sidewall upstanding therefrom to define a hollow box chamber interior thereof and generally open along front edges of the sidewall, wherein the improvement comprises:

a plurality of cable entry ports formed in a portion of the sidewall, said sidewall portion being of predetermined width and each said cable entry port adapted to provide access to the box chamber for an electrical power cable;

cable entry port closure means associated with each said cable entry port for generally closing its associated cable entry port when not used to provide access for the cable;

one of said cable entry ports and its associated closure means being recessed inwardly of said box chamber relative to the other cable entry ports in said sidewall portion, such that sufficient spacing is provided to accommodate all of said plurality of cable entry ports and associated closure

means within said predetermined width with greater strength in said sidewall portion than if none of said plurality of cable entry pors were recessed, thereby maximizing the number of said cable entry ports formed in said sidewall portion without reducing wall strength necessary to satisfy industry standards.



4,348,548

INSULATOR FOR COVERING ELECTRICAL CABLES

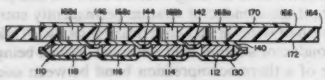
Michael A. Grundfest, Forest Hills, N.Y., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 11, 1979, Ser. No. 74,428

The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

Int. Cl.³ H01R *9/07*

U.S. Cl. 174—88 R **17 Claims**



8. An insulator for insulating the junctures between connected conductors of two or more substantially flat multiconductor cables comprising a spacer member having first and second opposed surfaces, said spacer member having a plurality of openings extending in an ordered pattern through said first and second surfaces and at least two spaced alignment apertures in configuration different from one another, an insulating member on said first surface of expanse sufficient to cover said openings and adhesive means on said second surface.

4,348,549

LOUDSPEAKER SYSTEM

Emmanuel Berlant, 9118 Olin St., Los Angeles, Calif. 90034

Continuation of Ser. No. 975,593, Feb. 6, 1978. This application Apr. 9, 1979, Ser. No. 28,599

Int. Cl.³ H04R *1/20*

U.S. Cl. 179—1 E **7 Claims**

1. A loudspeaker system comprising:

a generally tubular housing having a central vertical axis;

a high frequency electroacoustic transducer and a central axis horn receiving acoustic energy from said transducer and radiating said energy along said axis;

means for reflecting and diffracting the radiated energy approximately 90° radially 360° about said axis;

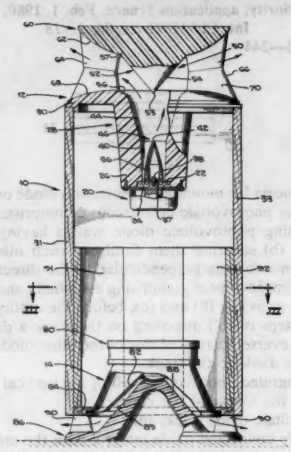
a radial horn for radiating said reflected and diffracted energy 360° about said axis;

a low frequency electroacoustic transducer including a cone centered on said axis for radiating acoustic energy along said axis in a direction opposite to that of the energy radiated by said high frequency transducer;

a loading plug having a contour substantially congruent with the cone and disposed in acoustic loading relation therewith;

and a crossover network for dividing the audio spectrum into high band pass and low band pass signals and feeding the signals to the respective transducers,

the effective length of said central axis horn being selected to virtually equalize the arrival times of the radiated acoustic energies in a listening area spaced laterally from the housing, by compensating for phase shift caused by the crossover network and the relative locations of the transducers.



4,348,550

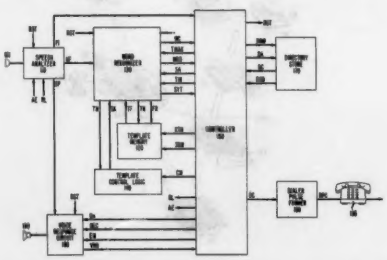
SPOKEN WORD CONTROLLED AUTOMATIC DIALER

Frank C. Pirz, Madison; Lawrence R. Rabiner; Aaron E. Rosenberg, both of Berkeley Heights, and Jay G. Wilpon, North Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 9, 1980, Ser. No. 128,842

Int. Cl.³ G10L *1/00*; H04M *1/274*

U.S. Cl. 179—1 SD **16 Claims**



1. A spoken word controlled repertory dialing circuit comprising:

a memory for storing a plurality of template signals representative of the acoustic features of reference words including command words and repertory words;

a directory store for storing a set of dialing signals corresponding to said repertory words;

a speech analyzer responsive to each input spoken word utterance for forming acoustic feature signals representative of said utterance;

a spoken word recognizer jointly responsive to said input

spoken word utterance acoustic feature signals from said speech analyzer and template signals from said memory for generating a signal identifying said input utterance;

means responsive to the input utterance identifying signal corresponding to a repertory word template for retrieving the corresponding dialing signal from said directory store;

and means responsive to each occurring input utterance identifying signal for selecting a predetermined set of template signals to identify the next occurring input utterance.

4,348,551

SERVICE BARGAIN ANNOUNCEMENT IN AN ELECTRONIC CASH REGISTER

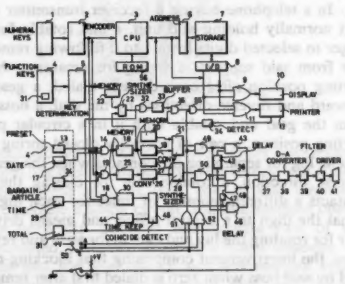
Hiroshi Nakatani; Masahide Ishida, both of Yamatokoriyama, and Hachizou Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1980, Ser. No. 130,999

Claims priority, application Japan, Mar. 16, 1979, 54-32158; Mar. 16, 1979, 54-32159; Mar. 16, 1979, 54-32160; Mar. 16, 1979, 54-32161

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SM **8 Claims**



1. An electronic cash register comprising:

numeral keys for introducing money information related to a register transaction and for introducing specific time information;

function keys for defining the kind of register transaction to be introduced;

a central processor unit responsive to said numeral and function keys for performing calculations with the introduced money information;

synthetic speech data storage means including a first memory means for storing synthetic speech data related to the next service bargain day and a second memory means for storing data related to the bargain article;

mode selection means for selecting said first or second memory means to select the desired synthetic speech data stored in said synthetic speech data storage means;

audio production means for providing an audible announcement through the use of the synthetic speech data selected by said selection means;

control means for applying said selected synthetic speech data to said audio production means in response to actuation of a specific key included in said function key;

time information keeping circuit means for calculating current time information;

time memory means for storing said specific time information;

a coincidence detection circuit for developing a coincidence detection output when the current time information becomes identical with said specific time information stored in said time memory means; and

automatic announcement conducting means for applying said selected synthetic speech data to said audio production means in response to said coincidence detection output.

4,348,552

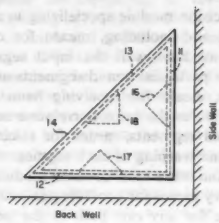
DIRECT/REFLECTING SPEAKER SYSTEM AND TRIANGULAR SHAPED ENCLOSURE

Ralph R. Siccone, 474 Barretts Mill Rd., Concord, Mass. 01742

Filed Jun. 9, 1980, Ser. No. 157,712

Int. Cl.³ H04R *1/20, 5/02*

U.S. Cl. 179—1 E **16 Claims**



1. A loud speaker system suitable for exact placement in the corners of a listening room comprising a triangular-shaped speaker enclosure comprising first and second vertically disposed planar side panels intersecting one another at a 90° angle, and a vertically disposed planar front panel intersecting with said first and second side panels and subtending angles of 45°, a woofer for low frequency reproduction in one of said first and second side panels, a tweeter for high frequency sound reproduction in said front panel, and a mid-range driver which reproduces the frequencies between the woofer and tweeter in the other of said first and second side panels, and a three-way electronic cross-over network.

4,348,553

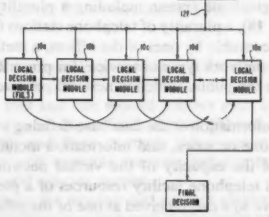
PARALLEL PATTERN VERIFIER WITH DYNAMIC TIME WARPING

James K. Baker, and Janet M. Baker, both of West Newton, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,466

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SB **9 Claims**



1. A speech recognition system, comprising:

an elementary recognizer for classifying the elementary segments of an observed speech pattern as they are received, said elementary recognizer including correlation means for producing at an output node of said elementary

recognizer a score of correlation of said elementary segments with stored spectral speech patterns; and

a plurality of local decision modules each connected to said output node for receiving said score of correlation; said plurality of local decision modules being connected at node points in a network wherein different network paths through the nodes and their corresponding local decisions modules represent an accumulation of speech segments constituting different pronunciations of said speech pattern, the input of each said local decision module connected to said correlation means to receive the measures of correlation;

each local decision module specializing in a particular network node and including, means for determining the probability of how well the input segment of speech matches the particular sound segments associated with a given node, means for receiving from the other local decision modules the prior correlation scores of all preceding sound segments, means for selecting the locally optimum time warping of each segment of speech which are input from other local decision modules, and accumulator memory means for providing an accumulated correlation score for any one path in the network of local decision modules, said path representing an accumulation of segments or parts of a word or sound;

whereby the accumulated correlation score represents the most probable pronunciation of said speech pattern and the best recognition match derived from all the possible paths in the network of local decision modules.

4,348,554

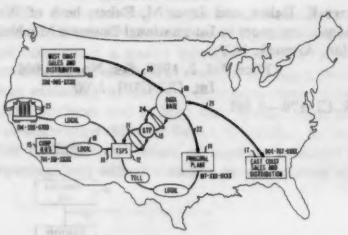
METHOD OF PROVIDING VIRTUAL PRIVATE NETWORK TELEPHONE SERVICE

Richard L. Asmuth, Oldbridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 21, 1980, Ser. No. 132,534

Int. Cl.³ H04M *3/42, 7/00, 15/00*

U.S. Cl. 179—18 B **28 Claims**



1. In a telephone system including a plurality of telephone offices (12, 18), a plurality of telephone stations (23), and a data base (10) accessible by ones of the offices, a method of providing private network types of services for prescribed ones of the stations via the public switched network, characterized by the steps of

storing information at the data base defining a virtual private telephone network, said information including a description of the capacity of the virtual network in terms of virtual telephone facility resources of a prescribed type,

responsive to a call received at one of the offices directed to the virtual private network, verifying at the data base that the call is entitled to be completed via the virtual network, and that an idle virtual resource remains for assignment to the call,

assigning the idle resource to the call, and completing the call over the public switched network.

4,348,555

TELEPHONE WITH LONG DISTANCE DIALING LOCK OUT

Andrew G. Basle, 44 Athinon Ave., Halandri, Greece

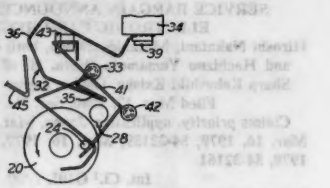
PCT No. PCT/US79/00366, § 371 Date Nov. 19, 1979, § 102(e) Date Nov. 19, 1979, PCT Pub. No. WO80/00052, PCT Pub. Date Jan. 10, 1980

PCT Filed May 29, 1979, Ser. No. 308,351

Claims priority, application United Kingdom, Jun. 5, 1978, 26334/78; Greece, Jul. 5, 1978, 56698

Int. Cl.³ H04M *1/66, 1/36*

U.S. Cl. 179—90 D **9 Claims**



1. In a telephone having a receiver-transmitter unit, a support normally holding said unit, a dial rotable forward by a finger to selected digits from 1 to 0 following removal of said unit from said support, a spring for returning the dial to a starting position after each digit is dialed, a gear driven in forward and reverse directions by the dial, a boss projecting from the gear and rotable with it in a circular path from a starting position, a pair of normally closed spring contacts, a rotable lug for separating the contacts when the gear rotates in reverse direction, a rotable cam for closing the separating contacts a different number of times for each digit dialed to signal the digit to a central office, and means driven by said gear for rotating the lug and cam in forward and reverse directions, the improvement comprising first blocking-means actuated by said boss when zero is dialed first after removal of said unit from said support for arresting reverse rotation of said lug until after the gear has returned said boss a predetermined distance toward said starting position, whereby said contacts will signal a digit other than zero, second blocking-means actuated by the boss as it moves into starting position for holding said first blocking-means out of engagement with the lug to permit a local number to be called, resetting means actuated by said unit when replaced on its support for moving said second blocking-means away from said first blocking-means, and manually operable means for preventing said lug-stopping actuation of said first blocking-means by said boss when it is desired that said contacts signal zero when zero is dialed first after removal of said unit from its support.

4,348,556

MULTI-POSITION SWITCH

William A. Gettig, and Larry E. Shook, both of Millheim, Pa., assignors to Gettig Engineering & Manufacturing Co., Spring Mills, Pa.

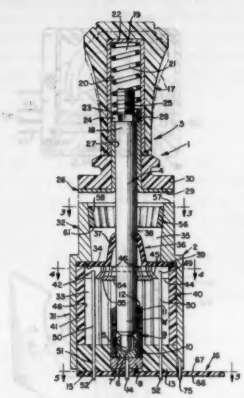
Filed Mar. 30, 1981, Ser. No. 248,975

Int. Cl.³ H01H *25/04*

U.S. Cl. 200—5 R **18 Claims**

1. A multi-position switch including, a housing having a cavity therein, an actuator rod provided with a lower portion disposed within said housing cavity, a contactor joined to said rod within said housing cavity, supporting means joined to said rod lower portion to maintain said rod in a normal at-rest axial position within said housing and allow radial displacement thereof, said joined contactor, rod and supporting means of electrically conductive material and defining a common primary side of a plurality of circuits to be completed upon said radial displacement of said rod, a plurality of normally free-standing longitudinal conductive contacts surrounding said

contactor and spaced therefrom when said rod is in said at-rest position, selected ones of said contacts representing the secondary side of a plurality of circuits, said housing including a control element surrounding said rod and adapted to restrict the displacement of said rod into a plurality of radial directions aligned with respective ones of said contacts and alternately disposed intermediate other ones of said contacts, said control element including a plurality of radially extending valleys for receiving said rod and allowing its radial displacement, alternate ones of said valleys aligned with at least one of said



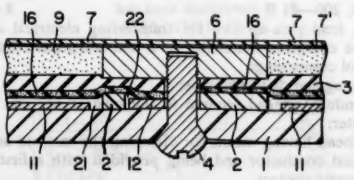
contacts associated with a single circuit whereby displacement of said rod into one of said alternate valleys directs said contactor into engagement with at least one of said associated contacts to complete a single circuit, and intermediate ones of said valleys vertically disposed intermediate two of said contacts associated with two separate circuits whereby displacement of said rod into one of said intermediate valleys directs said contactor into engagement with said contacts associated with two separate circuits to complete both of said two circuits.

4,348,557

KEY-BOARD SWITCH UNIT

Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,361
Claims priority, application Japan, Apr. 4, 1980, 55-45388[U]
Int. Cl.³ H01H *13/12*
U.S. Cl. 200—5 A **3 Claims**



1. A key-board switch unit which comprises

(a) a printed circuit board having, on one surface thereof, a plurality of fixed contact points, fixed terminals, a plurality of lead-out terminals and wiring circuits interconnecting the fixed contact points, fixed terminals and lead-out terminals with each other,

(b) an electrically insulating spacer sheet placed on the printed circuit board and provided with openings at positions corresponding each to one of the fixed contact points and fixed terminals on the printed circuit board,

(c) an elastically resilient and electrically insulating covering sheet member placed on the spacer sheet and provided with flexible and electroconductive contacting sheet members formed on the surface thereof facing the spacer sheet, each of the contacting sheet members facing at least one fixed contact point and at least one fixed terminal on the printed circuit board across the openings in the spacer sheet, and

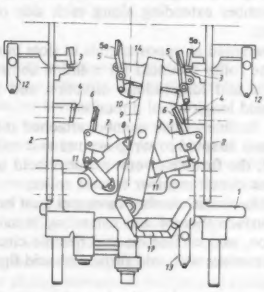
(d) at least one screw bolt penetrating the fixed terminal on the printed circuit board and the covering sheet member at the position corresponding to the fixed terminal through an opening in the spacer sheet to fasten together the printed circuit board and the covering sheet member with the spacer sheet sandwiched therebetween in such a manner that each of the contacting sheet members on the covering sheet member is contacted with at least one fixed terminal across an opening in the spacer sheet but a space for key stroke is left between the fixed contact point and the contacting sheet member on the covering sheet member, said space for key stroke being sufficiently narrow so that the contacting sheet member is brought into contact with the fixed contact point across an opening in the spacer sheet when the covering sheet member is pushed at the position corresponding to the opening in the spacer sheet at the fixed contact point.

4,348,558

DIVERTER SWITCH FOR AN ON-LOAD TRANSFORMER TAP CHANGER

Folke Johansson, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Dec. 28, 1979, Ser. No. 107,763
Claims priority, application Sweden, Jan. 5, 1979, 7900091
Int. Cl.³ H01H *3/32*
U.S. Cl. 200—6 R **4 Claims**



1. A diverter switch for an on-load transformer tap changer, comprising

a frame (1),

an electrically-conducting, movable contact carrier (9,14) mounted on said frame,

at least one first and one second contact pair, each of said contact pairs having a fixed contact (3) and a movable contact (5), said fixed contacts being mounted on said frame and said movable contacts being rotatably journalled on said contact carrier,

operating means for moving said contact carrier between a first end position, in which said first contact pair is closed and said second contact pair is open, and a second end position, in which said first contact pair is open and said second contact pair is closed, and

a first contact spring means (10) for generating contact pressure between the fixed and movable contacts of each

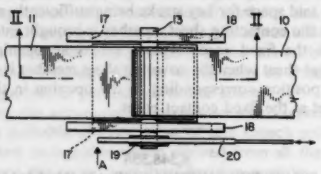
respective contact pair when being closed, characterized in that each of said movable contacts comprises two contact elements (*5a*, *5b*), which are positioned on opposite sides of said contact carrier, that a second contact spring means (15) is provided for pressing said contact elements against said contact carrier, and that said contact elements and said contact carrier are provided with sliding contact surfaces facing each other for transmitting current between said contact elements and said contact carrier.

4,348,559

ROTARY SWITCH USING A FLEXIBLE CIRCUIT MEMBER

Pak-Jong Chu, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 3, 1980, Ser. No. 212,272
Int. Cl.³ H01L *19/54*
U.S. Cl. 200—11 R **6 Claims**



1. A rotary switch using a flexible circuit member, comprising:

a support member;

a first circuit member having at least a portion supported on said support member and a plurality of contact areas on a surface of said portion, said contact areas in a pattern extending in a longitudinal direction on said surfaces;

a side member extending along each side of said support member;

a roller mounted at opposite ends in slots in said side members, the roller mounted for rotation about an axis transverse of said longitudinal direction and for movement along said longitudinal direction;

a second, flexible, circuit member attached at one end to said roller and adapte l to wrap around said roller on rotation thereof, the flexible circuit member held in contact with said first circuit member by said roller;

said flexible circuit member having at least one contact area on a surface thereof and extending in said longitudinal direction, said surface on said flexible circuit member in rolling contact with said surface on said first circuit member.

means for moving said roller in said longitudinal direction, the roller rotating about said axis, whereby contact between said contact area on said flexible circuit member and said contact areas on said first circuit member is varied.

4,348,560

TIMING MECHANISM HAVING A SHORT PULSE PRIOR TO ITS OVERALL PROGRAM

Donald L. Ray, Oaklandon, and Elmo Voland, Indianapolis, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 967,917, Dec. 11, 1979, Pat. No. 4,246,454. This application Nov. 10, 1980, Ser. No. 205,737
Int. Cl.³ H01H *7/00*
U.S. Cl. 200—38 A **2 Claims**

1. A timing mechanism comprising:

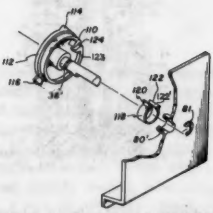
(a) shaft means,

(b) integrally constructed first ramp means and locator means for positioning said first ramp means rotatably carried by said shft means,

(c) clutch means comprising a clip ring coupled to said integrally constructed first ramp means and locator means and functionally engaging a boss through which said shaft means extends,

(d) a single cam slideably carried on said shaft means and coupling means coupling same to said shaft means for rotation therewith,

(e) spring means axially biasing said single cam,



(f) second ramp means coupled to said single cam and engaging said first ramp means to selectively axially displace said single cam in a predetermined direction,

(g) first and second cam followers engaging said single cam to be sequentially actuated in accordance with an axial displacement of said single cam, and switch means opening and closing in response to said cam followers, and

(h) release means permitting said single cam to axially displace past said cam followers to its original position.

4,348,561

MECHANICAL DEVICE FOR PICKING UP AN ELECTRICAL LOAD

Marvin D. McKelvy, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Aug. 5, 1980, Ser. No. 175,402
Int. Cl.³ H01H *13/28*
U.S. Cl. 200—51 R **8 Claims**

1. A load pick-up tool for transferring electrical current from an energized conductor to a non-energized conductor, said tool comprising:

an elongated dielectric tube;

a conductive head secured to the tube at one end of the latter;

said head having means for clamping the same to an energized conductor and being provided with a first, fixed electric contact;

an elongated, tubular, conductive guide in the tube spaced from said head;

means holding the guide against movement relative to the tube toward and away from the head,

said guide having means for connecting the same to a non-energized conductor and being provided with a second, fixed electric contact;

an elongated, conductive rod in the guide,

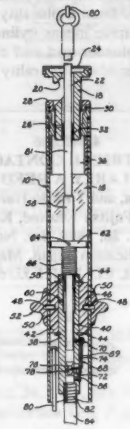
said guide supporting the rod for rectilinear reciprocation longitudinally of the tube and the guide along the longitu-

dinal axis of the rod toward and away from said first contact;

a releasable latch in the tube engageable with the rod for holding the rod at one end of its reciprocable path of travel remote from the first contact;

means operably connected to said latch for selectively releasing said latch for disengagement of said rod from said latch; and

spring means in the tube for forcing the rod toward the opposite end of its path of travel upon release of said latch,



said rod engaging both contacts when the rod is at said opposite end of its path of travel and having a latch-receiving groove at one end thereof remote from the first contact,

said latch being L-shaped, being mounted on the guide and having a leg disposed within the groove when the rod is at said one end of its path of travel,

said head having a passage therethrough for receiving an elongated device used to push the rod to said one end of its path of travel against the action of the spring.

4,348,562

POSITION SENSITIVE MERCURY SWITCH

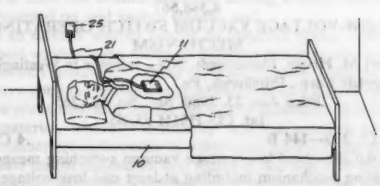
Robert E. Florin, 7921 S. Painter Ave., Whittier, Calif. 90602

Continuation-in-part of Ser. No. 133,002, Mar. 24, 1980, Pat. No. 4,282,412, which is a continuation-in-part of Ser. No. 935,363, Aug. 21, 1978, abandoned. This application Jan. 19, 1981, Ser. No. 226,367

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.³ H01H *29/20*

U.S. Cl. 200—52 R **12 Claims**



1. A mercury swtich assembly adapted to be secured to a patient for detecting changes in position, comprising in combination: a body having electrically non-conducting wall surfaces defining a head chamber and a foot chamber spaced by a connecting narrow throat passageway, said chambers being deeper and wider than said throat passageway, spaced electrodes projecting into said foot chamber, a ball of mercury capable of contacting said electrodes to form an electrical connection between them, said ball of mercury having a volume less than the volume of the head chamber and being normally contained within said head chamber when the switch assembly is in normal horizontal position, said walls being so shaped that said ball of mercury moves by gravity without delay from said head chamber through said narrow throat passageway and into said foot chamber when the switch assembly is tilted to incline said throat passageway to a slope of from 40° to 70° from horizontal, said head chamber having lateral extensions of substantial depth for continuously retaining said ball of mercury in said head chamber during lateral turning movement of the switch assembly when the inclination of said throat passageway is less than said slope inclination.

4,348,563

SNAP ACTION SWITCHES

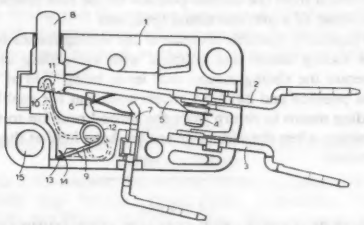
Michael I. Henville, Maidenhead, England, assignor to Unimax Switch Limited, Maidenhead, England

Filed Aug. 28, 1980, Ser. No. 182,222

Claims priority, application United Kingdom, Aug. 31, 1979, 7930347

Int. Cl.³ H01H *13/38*

U.S. Cl. 200—67 D **1 Claim**



1. A snap-action micro-switch comprising:

a casing having a plurality of mounting holes formed therein at preselected locations;

a fixed contact mounted within said casing;

An over-center snap action spring-loaded contact carrier mounting a movable contact and movable within said casing between a normal rest position occupied in the absence of an externally applied force and an operative position, said fixed contact being engaged by said movable contact in the rest position of said carrier;

an actuating button having first and second ends and guided for linear sliding movement within said casing;

said first end of said actuating button projecting outwards of said casing and said second end of said button engaging said carrier at a point displaced from said movable contact for movement of said carrier from said rest position to said operative position on inward sliding movement of said button in an actuating direction relative to said casing, said movement being effectable against the spring force of said spring-loaded carrier; and

auxiliary spring means acting on said actuating button comprising a hairpin spring located wholly within said casing on the opposite side of said carrier from said button and clear of said mounting holes and having first and second limbs;

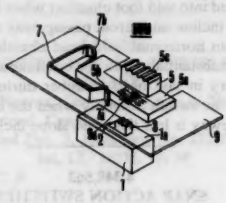
said first limb of said hairpin spring being located in a recess in said casing and said second limb of said hairpin spring engaging directly said second end of said actuating button, said hairpin spring being free of any contact with said contact carrier and being stressed such as to apply a force urging said button outwards of the casing.

4,348,564

SLIDE SWITCH

Shohei Ohtaki, Yokohama, and Masanori Yamada, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,438
Claims priority, application Japan, Oct. 17, 1979, 54-134460
Int. Cl.³ H01H *13/28*
U.S. Cl. 200—67 F 11 Claims



1. A slide switch comprising:

(a) sliding means slidable between a first position and a second position;

(b) holding means for releasably holding the sliding means in the second position when the sliding means assumes the second position and automatically enabling the sliding means to return from the second position to the first position after the lapse of a predetermined time; and

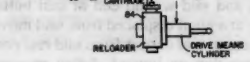
(c) a manually operable lever over the sliding means to cover the sliding means and coupled with the sliding means to operate the sliding means; said lever being held at least at one position and having a recess sufficient for enabling the sliding means to return from the second position to the first position when the sliding means has been held at the second position.

4,348,565

INTERCHANGEABLE CHEMICALLY OPERATED CIRCUIT BREAKER

Russell N. Yeckley, Murrysville, and Harvey E. Spindle, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 24, 1980, Ser. No. 171,700
Int. Cl.³ H01H *33/28*
U.S. Cl. 200—82 B 11 Claims



1. A circuit interrupter comprising:

a pair of separable contacts;

a movable operating mechanism connected to one of said separable contacts to cause movement thereof, said operating mechanism including a movable drive rod having a first end thereto; and

drive means for causing movement of said operating mechanism connected to said drive rod first end, said drive means comprising:

a reloader;

a drive means cylinder secured to said reloader and having disposed therein a movable piston and a piston rod secured to said piston, said piston rod extending outwardly of said drive means cylinder and being secured to said drive rod first end; and

pressure generating means in communication with the interior of said drive means cylinder, said pressure generating means generating a pressure within said drive means cylinder against said piston to cause movement thereof;

said drive means cylinder being preselected from a plurality of drive means cylinders each having a different cross-sectional interior area such that the amount of pressure generated within said drive means cylinder against said piston can be preselected from a plurality of pressures, each of said plurality of drive means cylinders capable of being secured to said reloader and said drive rod first end the same as each other of said plurality of drive means cylinders.

4,348,566

RHODIUM ELECTRICAL CONTACT OF A SWITCH PARTICULARLY A REED SWITCH

Masanori Baba, Suzaka, and Toshito Hara, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 28, 1980, Ser. No. 135,180
Claims priority, application Japan, Mar. 29, 1979, 54/36275
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B 19 Claims

1. An electrical contact of a switch, wherein said contact consists essentially of rhodium and 0.1 to 10 atomic % of silver;

said electrical contact being formed on at least one movable body, said movable body being moved in said switch due to a magnetic field applied to said movable body;

said movable body also being sealed gas-tight in an ampoule;

said at least one movable body comprising a pair of reed pieces of a reed switch, said reed pieces being attracted to each other due to the applied magnetic field;

said reed pieces being inserted through said ampoule at opposite ends of said ampoule, wherein the front opposing ends of the respective reed pieces overlap each other to form a gap therebetween within said ampoule;

said electrical contact being formed by an electrolytic plating process.

4,348,567

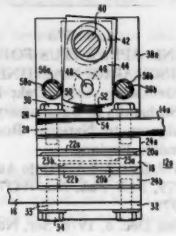
LOW-VOLTAGE VACUUM SWITCH OPERATING MECHANISM

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 23, 1980, Ser. No. 162,265
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B 4 Claims

1. An improved low-voltage vacuum switching means and operating mechanism including at least one low-voltage vacuum switch which includes axially movable contacts, which switch is connected via eccentric means to a rotary motion operating mechanism by linking means for translating the rotary motion to axial motion, which linking means has one end connected to the eccentric means, with the opposed linking means end pivotally connected to one axially movable

contact of the low-voltage switch, which linking means is axially movable with rotation of the eccentric means to effect opening and closing of the switch contacts, and wherein the linking means can move in a direction transverse to the axial movement direction as the eccentric means is rotated.



the improvement wherein linking means restraining guide means are disposed on opposed transverse sides of the linking means to limit and restrain the transverse movement of the linking means as the eccentric is rotated to move the linking means in essentially an axial direction.

4,348,568

SWITCHING MECHANISM

Eduard Hermle, Kirchstr. 20, D 7303 Neuhausen a.d.F., Fed. Rep. of Germany

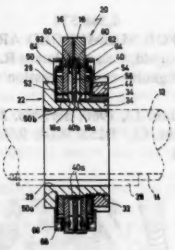
Filed Oct. 24, 1979, Ser. No. 88,060

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846369

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ H01H *3/42*

U.S. Cl. 200—153 LB **9 Claims**



1. A switching mechanism comprising:

(a) a rotatable switch spindle having a length dimension;

(b) means defining an unround portion on said switch spindle;

(c) at least one annular disc cam having a recess and being inserted on said switch spindle; and

(d) an annular washer having an unround central aperture; said washer being mounted adjacent said disc cam on said switch spindle about said unround portion whereby relative rotation between said washer and said switch spindle is prevented; said washer being of a plastically deformable material, whereby arbitrarily selected portions of said washer are deformable in a direction generally parallel to said length dimension; said recess of said disc cam and said washer being so positioned with respect to one another that in any angular position of said disc cam on said switch spindle a portion of said washer being plastically deformable into said recess for preventing a relative rotation between said washer and said disc cam, whereby said disc cam rotates as a unit with said switch spindle for cooperating with a switch alongside the switch spindle; said disc cam being angularly adjustable with respect to said switch spindle in the absence of said portion of said washer from said recess of said disc cam.

4,348,569

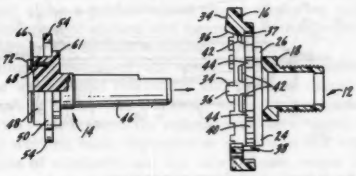
ROTARY SWITCH

Bernard J. Golbeck, Crystal Lake; Raymond F. Lewandowski, Mount Prospect, both of Ill.; Donald A. Rentzsch, Burlington, Wis., and Lonnie J. Richardson, Elgin, Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Aug. 15, 1980, Ser. No. 178,455

Int. Cl.³ H01H *19/14*

U.S. Cl. 200—155 R **14 Claims**



1. A rotary switch comprising a rotor having a flexible rim, a stator having a pocket for receiving the rotor, and retainer means formed on the stator for holding the rotor in the stator, the rim flexing past the retainer means upon initial assembly of the switch to permit entry of the rotor into the pocket, the rim thereafter snapping back to engage the retainer and hold the rotor in the pocket.

4,348,570

ELECTRIC CONTACT DEVICE WITH LIQUID CONDUCTORS

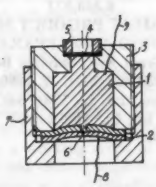
Francois J. Haussonne, Rue des sept tournants, Lannion, France (22300); Guy Moisan, Croix Gollo, Trebeurden, France (22560), and Hubert Prigent, 8, Res. "Place ar guer", Lannion, France (22300)

Filed May 9, 1980, Ser. No. 148,413

Claims priority, application France, May 10, 1979, 79 12372

Int. Cl.³ H01H *29/22, 29/00*

U.S. Cl. 200—191 **5 Claims**



1. Electric contact devices using an electrically conductive liquid enclosed in a sealed container, at least one surface or coating which is made of an electrically conductive material; an insulating material which will not absorb said liquid, said insulating material positioned intermediate said liquid and said conductive material; means of exerting pressure on said liquid; said insulating material being penetrated by at least one duct of a width such that, in a state of rest, capillary forces prevent the penetration of said liquid in said duct, while, when sufficient pressure is exerted, said liquid penetrates into said duct, establishing an electrically conductive path between said liquid and said conductive material, and such that, when said pressure ceases and the liquid returns to said state of rest, said liquid withdraws from said duct, thus breaking off said electrically conductive path; said device being characterized by the fact that the unit constituted by said insulating material and said

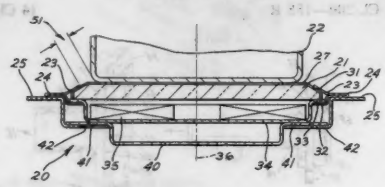
conductive material is formed as a single composite enamelled metal insulator-conductor unit.

4,348,571

FLUX SHAPING ARRANGEMENT FOR INDUCTION SURFACE UNIT

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 18, 1981, Ser. No. 244,845
Int. Cl.[3] H05B 6/12
U.S. Cl. 219—10.49 R 7 Claims



1. An induction cooktop comprising:

a planar horizontally disposed metallic surface having a plurality of openings therein;

an induction cooking unit disposed in one of said openings and adapted to support a cooking utensil thereon, said cooking unit including:

a metallic frame, said frame resting on portions of said surface bordering said opening,

a ceramic utensil support plate supported by said frame overlying said opening,

an induction heating coil,

means supporting said coil subjacent said plate, the axis of said coil being substantially coincident with the geometric center of said plate, and

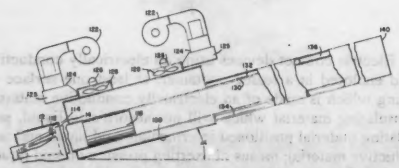
a conductive layer carried on the outer peripheral portion of said plate in contact with said frame and adapted to contact a utensil when the utensil is in position on said plate, thereby forming a continuous low reluctance flux path between said frame and the utensil whereby said layer limits flux leakage between the utensil and said frame.

4,348,572

SELF-SURFACED MEAT PRODUCT MANUFACTURING METHOD AND APPARATUS

Rex E. Moule, 370 Grant Ave., Satellite Beach, Fla. 32937

Division of Ser. No. 134,605, Mar. 27, 1980, Pat. No. 4,294,858.
This application Mar. 23, 1981, Ser. No. 246,812
Int. Cl.[3] H05B 6/78
U.S. Cl. 219—10.55 A 10 Claims



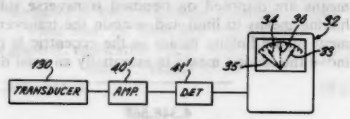
1. Apparatus for production of a meat product comprising container means for storing a liquefied product, forcing means for forcing the liquefied product from the container means, rate control means for controlling flow of product against a back pressure, tube means for receiving the product from the rate control means, said tube means including means for laterally constraining the product and thereby providing back pressure, microwave energy means surrounding the tube means for flowing microwave energy through the tube means and into the product, heating means connected to the tube means sequentially with the microwave energy means for heating the surface of the product to a high temperature, cooling means connected to the tube means sequentially following the heating means for cooling the surface of the product and means for releasing the product from the tube means.

4,348,573

METHODS AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING

Mohamed F. El-Menshawy, Selly Oak; Peter A. Woodrow, Sevenoaks, and Sushantha K. Bhattacharyya, Birmingham, all of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB78/00052, § 371 Date Aug. 13, 1979, § 102(e) Date Aug. 6, 1979, PCT Pub. No. WO79/00380, PCT Pub. Date Jun. 28, 1979
PCT Filed Dec. 8, 1978, Ser. No. 154,408
Int. Cl.[3] B23P 1/08
U.S. Cl. 219—69 M 23 Claims



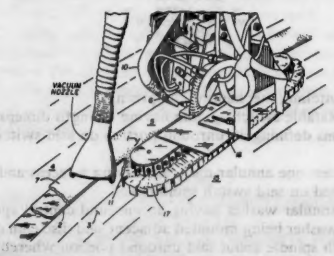
1. A method of electrical discharge machining characterized by receiving energy transmitted by the vibration of particles and emitted from the vicinity of the gap between an electrode and a workpiece when the electrode is being used to machine the workpiece, the energy having a characteristic which differs in some way or ways between first and second electrical discharge-conditions, and deriving a monitoring signal representative of the said characteristic from the energy received.

4,348,574

FLUX DAM FOR SUBMERGED ARC WELDING

John J. Barger, Ringgold, Ga., and James R. Underwood, Cleveland, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 13, 1980, Ser. No. 159,035
Int. Cl.[3] B23K 9/04, 9/18
U.S. Cl. 219—73.21 3 Claims



1. A system for welding cladding on a horizontal surface of a workpiece, including,

a workpiece oriented to have a surface extended substantially horizontal,

an arc welding head oriented relative to the horizontal work surface describing a track over the surface to lay down a bead of metal on the surface of the workpiece along an edge of the surface above a side of the workpiece,

a dam in the form of a series of abutting segments with each segment having a profile of chair-like configuration which segments are connected through their backs to a continu-

ous belt while the front of the segments are brought into frictional engagement with the side of the workpiece below the edge to form a groove below the horizontal surface of the workpiece at the location along which the arc welding head lays down its bead,

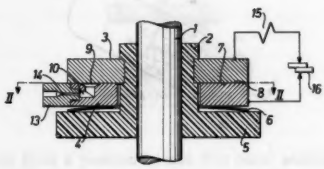
and a supply of flux in granular form directed to flow as an overburden of the arc and between the dam and the workpiece,

whereby, the flux between the dam and the workpiece is positioned to function as a molding body to limit the molten materials of the welding process and form a bead substantially flush with the edge of the substantially horizontal work surface.

4,348,575
CONTACT DEVICE

A. Thomas Hedren, Askersund, and Rolf G. Larsson, Laxa, both of Sweden, assignors to ESAB Aktiebolag, Gothenburg, Sweden

Filed Jun. 24, 1980, Ser. No. 162,428
Claims priority, application Sweden, Jun. 28, 1979, 7905678
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—86.33 **8 Claims**



1. In a resistance welder, a combined pivot joint and electric contact device between two welding current conductors forming part of the welding circuit of the resistance welder, comprising:

a joint pin,

a pair of flat contact plates extending at right angles to said joint pin and connected each to one of said conductors, said contact plates being supported for relative rotation about said joint pin and being axially displaceable with respect to each other between a contact position in which the contact plates engage each other and an idle position in which the contact plates are out of engagement with each other,

means for yieldably urging at least one of said contact plates towards the other contact plate, and

means for moving said contact plates out of engagement with each other including

a channel provided in at least one of the contact plates, said channel having an outlet port in the plate surface facing the other contact plate and an inlet, and,

means including a valve and a supply conduit for connecting said inlet to a source of compressed gas.

4,348,576
POSITION REGULATION OF A CHARGE CARRIER BEAM

Peter Anderl, Munich, and Clauspeter Mönch, Grafrath, both of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Puchheim, Fed. Rep. of Germany

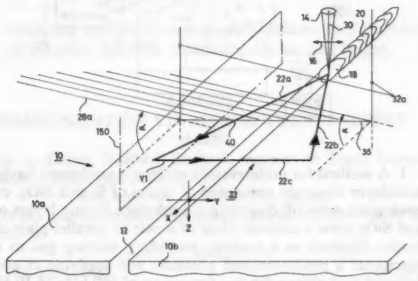
Filed Jan. 8, 1980, Ser. No. 110,555
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2901148; Sep. 13, 1979, 2937094
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 EW **13 Claims**

1. In a charged particle beam process, wherein a charged particle beam generator generates a beam of charged particles directed at a workpiece along an axis and said beam impinges upon a surface of said workpiece at a working beam impingement point, wherein said beam generator is moved relative to said workpiece in a first direction, thereby to move said working beam impingement point along a working path on said workpiece, a method for measuring the deviation of said working beam impingement point from an ideal beam impingement point comprising the steps of:

positioning an X-ray radiation sensor having an angular region of sensitivity defined by a boundary, said sensor being positioned at a fixed location relative to said beam generator such that said boundary comprises a boundary line on said workpiece spaced from said ideal beam impingement point;

periodically deflecting said beam of charged particles to move said working beam impingement point during a deflection time interval, with predetermined deflection speed, along a predetermined closed measuring path on said workpiece surface, said measuring path crossing said boundary line on said workpiece surface;

detecting the output of said sensor during said deflection time interval and comparing said detected output to a threshold value, said threshold value being selected to have a value between the value of said output signal when said working beam impingement point is in said angular region of sensitivity and the value of said output signal when said working beam impingement point is outside said region, thereby to measure the time during said interval at which the working beam impingement point of said beam crosses said boundary line;



and analyzing said time measurement with respect to said deflection speed and path, thereby to determine the deviation of said working beam impingement point from said ideal beam impingement point.

13. In a charged particle beam apparatus having a charged particle beam generator for emitting a beam of charged particles along a beam axis onto a surface of a workpiece, wherein said workpiece is moved in a first direction relative to said beam axis whereby a working point of impingement of said beam moves across said surface, apparatus for determining the location of the working point of impingement of said beam on said surface relative to said generator comprising:

a sensor for X-ray radiation, located in a fixed position relative to said generator and having an angular region of sensitivity defined by boundary surfaces which intersects said workpiece surface to form a boundary line spaced from said working point of impingement;

timing means for generating periodic measurement deflection timing signals;

deflection means, responsive to said deflection timing signals, for deflecting said charged particle beam to move the actual impingement point during a deflection time interval, with predetermined deflection speed, along a predetermined closed measuring path on said workpiece surface, said measuring path crossing said boundary line on said workpiece surface;

threshold means, responsive to the output of said sensor during said deflection time interval, for comparing said

output to a threshold value, said threshold value being selected to have a value between the value of said output signal when said actual impingement point is in said angular region of sensitivity and the value of said output signal when said actual impingement point is outside said region, thereby to generate a threshold timing signal representative of the time during said interval at which the actual impingement point of said beam crosses said boundary line;

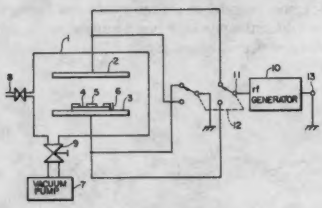
and signal processing means, responsive to said deflection timing signals and said threshold timing signals for generating signals representative of the location of said working impingement point of beam impingement relative to said generator.

4,348,577

HIGH SELECTIVITY PLASMA ETCHING METHOD

Hiroyasu Toyoda; Hiroyoshi Komiya, and Hideaki Itakura, all of Kawasaki, Japan, assignors to VLSI Technology Research Association, Kanagawa, Japan

Filed Sep. 3, 1980, Ser. No. 183,710
Claims priority, application Japan, Dec. 12, 1979, 54-163006
Int. Cl.[3] B23K *9/00;* H01L *21/306*
U.S. Cl. 219—121 PE 3 Claims



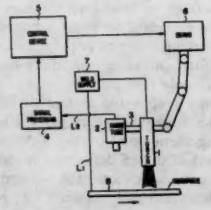
1. A method for preferentially etching a workpiece having a multilayer structure composed of layers of Si and SiO_2, comprising the steps of: disposing a workpiece having layers of Si and SiO_2 upon a cathode plate of a pair of parallel-plate electrodes disposed in a reactor; providing etching gas to said reactor at a predetermined pressure; and applying rf power between said electrodes at a frequency of 400 kHz to 10 MHz with a high voltage terminal of said rf power generator coupled to said cathode plate upon which said workpiece is disposed.

4,348,578

WORKPIECE MONITORING MEANS FOR ELECTRIC DISCHARGE WORKING APPARATUS

Ichiro Masaki, Kobe, Japan, assignor to Unimation, Inc., Danbury, Conn.

Filed Aug. 14, 1979, Ser. No. 66,323
Claims priority, application Japan, Aug. 15, 1978, 53/99319
Int. Cl.[3] B23K *9/10*
U.S. Cl. 219—130.01 13 Claims



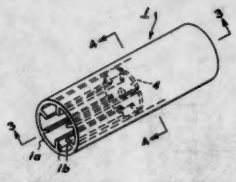
1. A method for monitoring a workpiece in a light generating arc welding process, wherein arc welding is performed by optically detecting the position of the workpiece to be arc welded and controlling the position of a welding torch on the basis of the result of the detection, the method comprising the steps of substantially repetitively interrupting the welding process at selected intervals by control of the power to the welding torch, and optically detecting the position of the workpiece via a positional image signal at said selected, repetitive intervals when the welding process is substantially interrupted and the light generation of the arc welding arrangement is reduced.

4,348,579

FIXING ROLL IN A COPYING MACHINE

Yoshiharu Namba, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Jun. 16, 1980, Ser. No. 160,766
Claims priority, application Japan, Jun. 28, 1979, 54-087569
Int. Cl.[3] H05B *3/02;* B21B *27/06*
U.S. Cl. 219—216 3 Claims



1. Heat and pressure fuser apparatus for fixing toner images to copy substrates passing through a nip formed between two pressure engaged roll structures, at least one of the roll structures being heated and contacting the toner images as the substrates pass through said nip, the improvement comprising:

said at least one of said roll structures being characterized by a cylindrical configuration having an outer circumferential wall which is relatively thin thereby having a relatively small heat capacity for minimizing the time required to elevate it to the fusing temperature,

said at least one of said roll structures further characterized by reinforcing means associated with said circumferential wall for rendering said relatively thin wall sufficiently rigid to withstand the pressures to which it is subjected during fusing, said reinforcing means comprising a plurality of reinforcing ribs extending along the length of said wall and radially inward toward the center of said at least one roll structure,

said at least one of said roll structures being further characterized by the provision of a plurality of plate members disposed transversely relative to the longitudinal axis of said at least one of said roll structures and provided with slots for receiving said reinforcing ribs,

said plate members cooperating with said reinforcing ribs to render said circumferential wall rigid.

4,348,580

ENERGY EFFICIENT FURNACE WITH MOVABLE END WALL

Charles F. Drexel, Rolling Hills Estates, Calif., assignor to Tylan Corporation, Carson, Calif.

Filed May 7, 1980, Ser. No. 147,660
Int. Cl.[3] F27B *5/14;* F27D *19/00*
U.S. Cl. 219—390 14 Claims

1. A furnace, comprising:

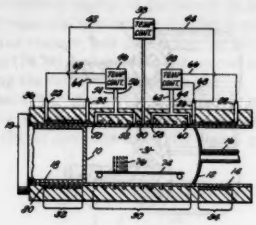
a first tubular member having opposite first and second ends, said tubular member being open on at least said first end and defining an elongate chamber having an elongate

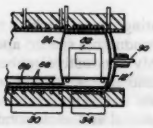
inner section spaced inwardly from said open end and at least a first outer section terminating at said first end;

means for introducing process gas through said second end;

means for separately heating said inner and outer sections, comprising means for heating said elongate inner section and a guard heater on said first outer section for heating a substantial portion of said first outer section;

means for closing said open end, comprising a first wall normal to the axis of said tubular member disposed in the open end of said tubular member, said wall being movable





to and from a position in said first outer section that is adjacent the outer edge of said inner chamber section;

means for sensing a differential in temperature between a central portion of said inner chamber section and the outer edge of said inner chamber section proximal to said open end; and

means for varying the extent of heating of said first outer section in accordance with said sensed temperature differential to provide a predetermined temperature relationship between said first outer chamber section and said inner chamber section.

4,348,581

ELECTRIC HOTPLATE

Karl Fischer, Am Gänsberg 23, D-7519 Oberderdingen, and Felix Schreder, Oberderdingen, both of Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 177,873

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933296

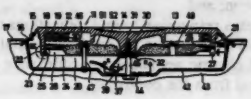
Int. Cl.³ H05B *3/68*

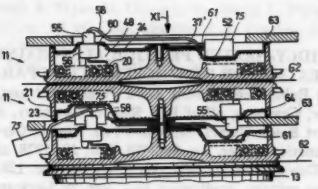
U.S. Cl. 219—460 **17 Claims**

1. Stackable hotplates, each having a hotplate member with a downwardly directed annular border on its outer periphery, the border having a free lower edge, and each comprising:

a covering sheet having an outwardly directed flange and having adjacent to the flange a step directed towards the inside of the hotplate, said flange resting on the free lower edge of the border and said step cooperating with the inner circumference of the border in order to center the covering sheet, the covering sheet having an opening and an upwardly projecting depression, the opening and the depression being radially equally spaced from the center of the covering sheet but angularly displaced from one another; and,

an insulating member disposed in the opening and projecting downwardly from the covering sheet, electrical connections for the hotplate member passing through the insulating member, whereby stacking two of said hotplates together, with their covering sheets facing one another, the





insulating member of each hotplate fits into the depression of the other hotplate, minimizing the stacked height.

4,348,582

COMMUNICATION VIA AN ELECTRICITY SUPPLY MAIN

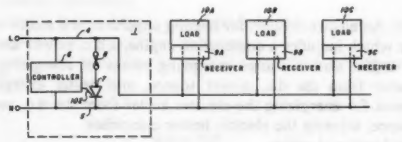
Jerzy A. Budek, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 14, 1979, Ser. No. 20,298

Claims priority, application United Kingdom, Mar. 14, 1978, 10039/78

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—483 **6 Claims**



1. A control system for remotely controlling at least one alternating current electric-mains-operated appliance, including:

a controller having electronic switch means for superimposing a control signal on an alternating current mains supply by interrupting the mains supply for a period adjacent a zero crossing in one or more selected half-cycles of the mains supply and substantially less than the mains supply cycle period thereby to hold the mains supply voltage substantially at zero during said interruption;

at least one receiver means for monitoring the mains supply and for controlling said electrical appliance said receiver having

(A) interruption detector means including a full wave rectifier means for providing a full-wave rectified signal from said mains supply; voltage threshold detector means for receiving said full-wave rectified signal and producing an output whenever the voltage of said full-wave rectified signal is lower than a threshold voltage;

and means for responding to the durations of said outputs from said voltage threshold detector means to produce an indication of the occurrence of a said interruption; and

(b) means responsive to said indications of the occurrence of an interruption to produce outputs for controlling said electric appliance in accordance with the control signal from the controller.

4,348,583

RAPIDLY-HEATED PERIODICALLY-MAINTAINED HEATER FOR MOTOR VEHICLE APPARATUS

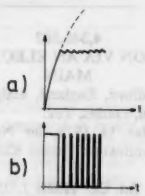
Carsten Bube, Ludwigsburg; Gerd Thiele, Stuttgart, and Hans Zeller, Grafenau, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 898,758, Apr. 20, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,765

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726458

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **12 Claims**



1. An electric heater, for heating apparatus in a motor vehicle which includes a combustion engine, a d.c. power source, an engine starter, starter energizing means for energizing the starter from the d.c. power source, and heater energizing means for energizing the electric heater from the d.c. power source, wherein the electric heater comprises:

a heating element;

switch means for connecting said heating element to said d.c. power source; and

switch control means for controlling said switch means so as to deliver to said heating element a predetermined amount of electrical energy during a first time interval and a heater current during a second, consecutive time interval during which said heater current varies periodically as a function of the heating element temperature and current supplied to the engine starter, said switch control means including

temperature simulating means for simulating the temperature of said heating element electronically, said temperature simulating means being adapted to continuously provide an electrical output signal corresponding to said heating element temperature whenever said electric heater is energized, and

synchronizing means for synchronizing maximum portions of said heater current with respective minimum portions of the undulating starter current.

4,348,584

FLEXIBLE HEATING ELEMENTS AND PROCESSES FOR THE PRODUCTION THEREOF

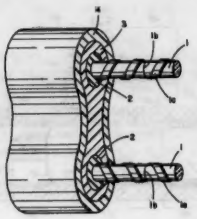
George M. Gale, Shrewsbury; David I. James, Wem, and John V. B. Meyer, Salford, all of England, assignors to Sunbeam Corporation, Chicago, Ill.

Filed May 9, 1980, Ser. No. 148,378

Claims priority, application United Kingdom, May 10, 1979, 7916273

Int. Cl.³ H05B *3/34, 3/54*

U.S. Cl. 219—549 **7 Claims**



1. A flexible heating element which comprises at least two flexible electrical conductors spaced apart by a PTC material, an amorphous highly conductive rubber compatible with the said PTC material and adhered to and completely surrounding each conductor, said conductive rubber being interposed between the PTC material and each conductor whereby in use current passes from one conductor to another through the PTC material via the said highly conductive rubber, said conductors and said conductive rubber which coats said conductors being completely enveloped by said PTC material, the conductors being spaced sufficiently close to one another to ensure that when energized the PTC material heats substantially uniformly without exhibiting a significant temperature gradient between the conductors and that any abnormal temperature increase increases the temperature of all the PTC material between the conductors in the region of the abnormal temperature increase, the amorphous highly conductive rubber interposed therebetween providing improved current conduction between the conductors and said PTC material.

4,348,585

FREQUENCY/SPEED CONTROLLER

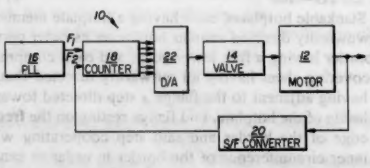
John P. Hoffman, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00209, § 371 Date Apr. 2, 1979, § 102(e) Date Apr. 2, 1979

PCT Filed Apr. 2, 1979, Ser. No. 83,997

Int. Cl.³ G06M *3/04*

U.S. Cl. 235—92 CT **14 Claims**



1. An integrating frequency-difference counter (18) comprising:

an up/down counter (24) having an up/down input (26), a clock input (28) and an output (30), said counter (24) being free to count in response to receiving a clock signal at the clock input (28), free to count up in response to receiving an up count signal at the up/down input (26), and free to

count down in response to receiving a down count signal at the up/down input (26);

signal generating means (64,66) for generating first, second, third and fourth outputs (68,70,72, 74), said outputs (68,70,72,74) being generated at a preselected frequency in a preselected sequential order;

first means (94,96,98,100) for receiving a first reference frequency signal of frequency f_1, combining the first frequency signal with the first output (68) in a preselected manner, and producing the clock signal;

second means (94',96',98',100') for receiving a second controlled frequency signal of frequency f_2, combining the second frequency signal with the third output (72) in a preselected manner, and producing the clock signal;

third means (76,78) for receiving the second output (70) and producing the down count signal; and

fourth means (78,80) for receiving the fourth output (74) and producing the up count signal, the output (30) of the counter (24) at any time being the digital guantized form of

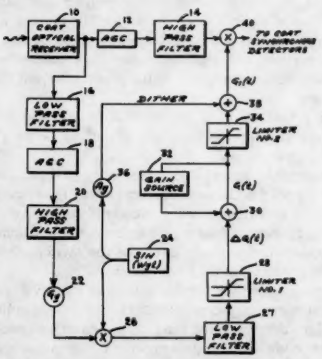
$$\int_0^t (f_1 - f_2)dt.$$

4,348,586

AUTOMATIC BANDWIDTH CONTROL SYSTEM

Stanislaw A. Kokorowski, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 9, 1980, Ser. No. 185,472
Int. Cl.[3] H01J 40/14
U.S. Cl. 250—214 R 6 Claims



1. An automatic bandwidth control system for an adaptive optics servo comprising in combination:

a bandpass filter means receiving a photodetected signal, said bandpass filter means removing unwanted high and low signals, said bandpass filter means maintaining a predetermined signal level,

a gain parameter means receiving the output signal from said bandpass filter means, said gain parameter means multiplying said output signal by a gain parameter to provide a gain correction signal,

a modulation means operating at a dither frequency, ω_g, said modulation means providing a modulation signal,

a multiplier means receiving said gain correction signal and said modulation signal, said multiplier means providing a DC gain correction signal,

a low pass filter means receives and filters said DC gain correction signal to remove noise and unwanted signals,

a first limiter means receives said DC gain correction signal from said low pass filter means to maintain the signal within predetermined limits,

a gain source provides a gain factor that is added to said DC gain correction signal to provide a gain signal,

a second limiter means receives said gain signal and limits said gain signal to a predetermined level,

a gain modulation means receives said modulation signal, said gain modulation means multiplies said modulation signal by an amplitude factor to provide a dither signal, and

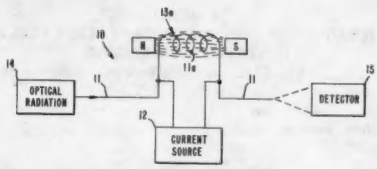
an adder means receives and adds together said dither signal and said gain signal to provide a bandwidth correction signal.

4,348,587

FIBER OPTIC TRANSDUCER FOR MEASURING CURRENT OR MAGNETIC FIELD

Gregory L. Tangonan, Oxnard; Robert J. Morrison, Thousand Oaks; Joseph A. Wysocki, Oxnard, and David L. Persechini, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 17, 1980, Ser. No. 207,107
Int. Cl.[3] G01R 31/00
U.S. Cl. 250—227 10 Claims



1. A fiber optic transducer including:

(a) a multi-mode optical fiber adapted to transmit optical radiation, at least a portion of said optical fiber also adapted to conduct electricity;

(b) means for introducing optical radiation into said optical fiber;

(c) means for impressing a current on said portion adapted to conduct electricity;

(d) means for applying a magnetic field to a portion of the current-carrying optical fiber; and

(e) means for providing an optical output from said optical fiber.

4,348,588

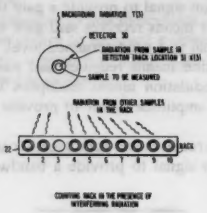
METHOD FOR COMPENSATING MEASURING VALUES WHEN MEASURING THE RADIATION FROM A NUMBER OF RADIOACTIVE SAMPLES IN AN AUTOMATIC RADIATION DETECTING INSTRUMENT

Tapio Yrjönen; Urpo Pietilä, both of Turku, and Tim Rawlins, Yliskulma, all of Finland, assignors to Wallac Oy, Turku, Finland

Filed Oct. 19, 1979, Ser. No. 86,513
Int. Cl.[3] G01D 18/00; G01T 1/00, 1/20
U.S. Cl. 250—252.1 3 Claims

1. Method for correction of measuring values when measuring the radiation from a number of radioactive samples in a radiation measuring instrument where a radiation detector in addition to the radiation from sample is affected by the radiation from a number of other sources of radiation which during the measurement have predetermined locations in respect to the detector, characterized in that first the degree of affection in the detector from the radiation of the sample and from sources in said locations is determined by means of locating a known radiation source of known activity in each of said

locations and determining and storing the measuring values thus obtained, whereafter the measuring value for each sample



is compensated for by considering the measuring value from the other sources and said degree of affection.

4,348,589

MICROPHONIC NOISE COMPENSATION FOR AN IONIZATION DETECTOR

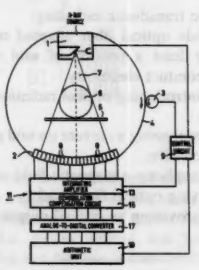
Petrus N. J. Vis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,702

Claims priority, application Netherlands, Jun. 25, 1979, 7904923

Int. Cl.³ H01J *39/28*

U.S. Cl. 250—387 **3 Claims**



1. A device for measuring local absorption differences in an object, said device comprising a detector comprising:

a chamber filled with gas;

a high-voltage electrode in the chamber;

a signal electrode arranged in the chamber adjacent to, but spaced from, the high-voltage electrode;

a high-voltage source connected to the high-voltage electrode; and

a signal measuring circuit connected to the signal electrode;

wherein, in operation the detector has an output signal at the signal electrode comprisi..g a real measuring signal modulated by a microphonic noise signal;

CHARACTERIZED IN THAT the device further comprises:

an alternating voltage source for producing a high-frequency alternating voltage which modulates the high-voltage source and the detector output; and

a demodulator compensation circuit for isolating the microphonic noise signal from the detector output.

4,348,590

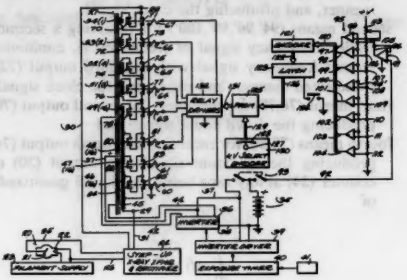
X-RAY TUBE ANODE VOLTAGE COMPENSATOR

Herbert E. Daniels, Brown Deer; Harold E. Stehman, Hales Corners, and Brian P. Moran, Mukwonago, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,644

Int. Cl.³ H05G *1/32, 1/34*

U.S. Cl. 378—112 **6 Claims**



6. A method of compensating the voltage applied between the anode and cathode of an x-ray tube for power source voltage variations, comprising:

providing a transformer having its input supplied from the power source and having an output circuit comprised of a plurality of windings for being connected with switches in various combinations to provide corresponding voltages to another step-up transformer which supplies the anode-to-cathode voltage to the x-ray tube,

performing the steps of adjusting the power source to provide a particular voltage and opening and closing the switches in various combinations while making a series of x-ray exposures with the x-ray tube conducting for each combination and recording the data indicative of the voltage actually applied to the x-ray tube and the source voltage,

repeating said steps at incremental changes in the source voltage through at least the expected range of source voltage variations,

then programming a read-only memory so it will respond to binary coded addresses representative of particular source voltages and related x-ray tube applied voltages, respectively, corresponding with said data by producing a digital code word representative of the switch combination existing when the data was obtained,

developing addresses for the read-only memory representative of prevailing source voltage and desired applied voltage for addressing the read-only memory to produce the digital code word representative of the switch combination, and providing means which respond to said digital words by establishing the switch combination.

4,348,591

UTILIZING GAMMA CAMERAS FOR UPTAKE STUDIES AND RESTRICTED FIELDS OF VIEW AND MULTIPLE APERTURE COLLIMATOR SYSTEMS THEREFOR

Alan M. Wunderlich, Pringle Rd., Miller Place, N.Y. 11764

Filed Nov. 26, 1979, Ser. No. 97,168

Int. Cl.³ G21K *1/00;* **G01T** *1/20;* **G21K** *1/04*

U.S. Cl. 250—505.1 **10 Claims**

1. A straight bore flat field masking collimator for multiple detector imaging gamma cameras comprising:

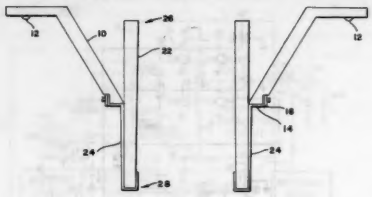
(A) an open generally cylindrical radiation shield, having a camera end and an aperture end, the greatest inner dimension thereof being substantially between two and five inches, and

(B) a radiation shielding portion at the camera end of said

cylindrical radiation shield for mounting to a gamma camera and for masking off the greater portion of the gamma camera's multiple detectors.

8. A masking collimator for a multiple detector imaging gamma camera comprising:

(A) a generally cylindrical radiation shield having a camera end and an aperture end, the greatest inner dimension



thereof being substantially between two and five inches, said shield being a solid cylinder of radiation shielding material having a plurality of channels, and

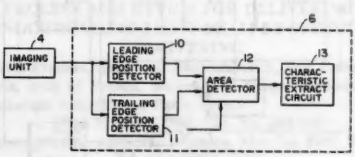
(B) a radiation shielding portion at the camera end of said cylindrical radiation shield for mounting to a gamma camera and for masking off the greater portion of the gamma camera's multiple detectors.

4,348,592

APPARATUS FOR READING PATTERNS

Seiichiro Kimura, Komae; Yuhei Iwasaki, Fujisawa, and Yuji Kozaki, Yokohama, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,833
Claims priority, application Japan, Jan. 31, 1980, 55-9295
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—560 **9 Claims**



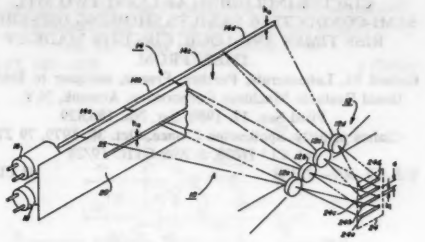
1. In an automatic apparatus for reading object portions of a pattern, said object portions having a light reflective characteristic different from other portions of the pattern, said apparatus having a light source for uniformly illuminating said pattern, an imaging unit for receiving light from said pattern to produce an image signal when receiving light from said object portion, and drive means for moving said pattern relative to said imaging unit to scan said pattern in successive increments, the improvement comprising means responsive to said image signals for producing a leading-edge signal upon first encountering said object portion after a previous scan not encountering said object portion, means responsive to said image signals for producing a trailing edge signal upon last encountering said object pattern, area detection means for detecting the area of said object pattern scanned between producing said leading edge signal and said trailing edge signal determining a selected characteristic of said object portion.

4,348,593

TWISTING GEOMETRY OPTICAL SYSTEM UTILIZING IMAGING ARRAY WITH TIME DELAY SEGMENTS

Ned J. Seachman, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1981, Ser. No. 229,375
Int. Cl.³ H04N *1/10*
U.S. Cl. 250—578 **6 Claims**



1. An optical apparatus for line-by-line scanning of an original document comprising:

means for illuminating an information-bearing scan line on said document, said line extending in a predetermined axial direction;

an area detector array including a plurality of detector units oriented along an axis perpendicular to said axial direction;

said detector units comprising a plurality of multiple time delay integrator detectors; and

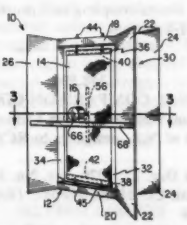
means for projecting an image of said illuminated scan line onto said detector array, said means including an array of lenses oriented along an axis tilted with respect to the axial direction of said scan line in a manner whereby the information content of a plurality of segments of said scan line is each projected upon a predetermined detector unit.

4,348,594

WIND POWER GENERATOR

Donald E. Lipfert, Box 142 River Rd., Woolwich, Me. 04579

Filed Jul. 14, 1980, Ser. No. 168,129
Int. Cl.³ F03D *5/06*
U.S. Cl. 290—54 **16 Claims**



1. A device for generating energy derived from a moving fluid comprising:

a. housing means for guiding the moving fluid generally parallel to a predetermined direction;

b. means disposed within the housing means for oscillating generally transversely to the predetermined direction in response to the movement of the fluid, said oscillating means including a generally flat flexible membrane supported within the housing means under tension, said membrane positioned so as to have at least one edge disposed so as to divide the fluid flow to pass over the surfaces of

said membrane such that vortices are created which cause said membrane to oscillate; and

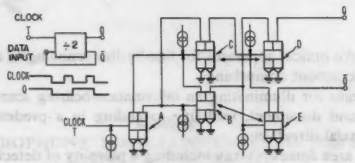
c. means coupled to at least a portion of the surface of said membrane for converting the oscillatory motion thereof into energy which is derived from the energy of the moving fluid.

4,348,595

CIRCUIT INCLUDING AT LEAST TWO MTL SEMI-CONDUCTING DEVICES SHOWING DIFFERENT RISE TIMES AND LOGIC CIRCUITS MADE-UP THEREFROM

Gerard M. Lebesnerais, Perthes, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,829
Claims priority, application France, Oct. 30, 1979, 79 27386
Int. Cl.³ H03K *3/286;* **G11C** *19/28*
U.S. Cl. 307—221 R **41 Claims**



1. A bistable device having first and second stable states and control means for causing said bistable device to preferentially assume said second state, said bistable device and control means comprising:

a first I^2L circuit having a data input and first and second outputs;

a second I^2L circuit having an input and an output;

a third I^2L circuit having an input and an output;

a fourth I^2L circuit having at least a control input;

first passive connection means for connecting in common said first output of said first I^2L circuit, said input of said second I^2L circuit and said output of said third I^2L circuit;

second passive connection means for connecting in common said second output of said first I^2L circuit, said input of said third I^2L circuit and said output of said second I^2L circuit; and

solid state circuit means coupling said fourth I^2L circuit means to said second I^2L circuit.

4,348,596

SIGNAL COMPARISON CIRCUIT

James H. Atherton, Flemington, and Clifford P. Jindra, North Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1979, Ser. No. 107,403
Int. Cl.³ H03K *17/687, 19/092*
U.S. Cl. 307—264 **9 Claims**

1. The combination comprising:

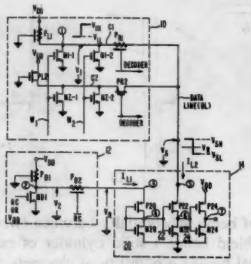
a signal generator having an equivalent source impedance R_1 and producing signals at its output having either one of first (V_{1H}) and second (V_{1L}) values;

a reference generator having an equivalent source impedance R_3, and producing a signal at its output having a value intermediate V_{1H} and V_{1L};

a sense amplifier having first and second inputs and an output, said sense amplifier being responsive to the signals at its first and second inputs and producing a signal at its output indicative of the signal at its first input being more positive than, equal to, or less positive than, the signal at its second input, said sense amplifier being further characterized in that there is a load current associated with each one of its first and second inputs in response to the applied input signals;

a first coupling means having an impedance R_2 connected between the output of the signal generator and said first input of said sense amplifier; and

a second coupling means connected between the output of said reference generator and said second input, said second coupling means having an impedance R_4 such that: $R_4=K(R_1+R_2)-R_3$, where K is equal to the ratio of the current flowing through said first input to that flowing through said second input of said sense amplifier, and R_1, R_2, and R_3 represent the ohmic values of said signal generator source impedance, of said first coupling means impedance, and of said reference generator source impedance, respectively.

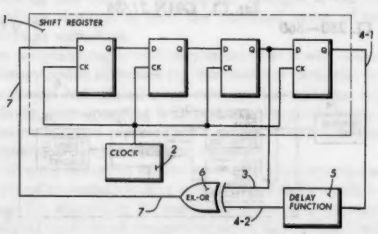


4,348,597

LATCHUP RESISTANT PSEUDORANDOM BINARY SEQUENCE GENERATOR

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed May 27, 1980, Ser. No. 153,401
Int. Cl.³ H03K *3/84*
U.S. Cl. 307—269 **9 Claims**



1. A pseudorandom binary sequence generator including means adapted thereto for providing latchup resistance, including in combination:

a. a source of clock signal;

b. a shift register means coupled with said clock signal, having a data input thereto and plural stage outputs therefrom;

c. dynamic imbalance means coupled to at least one said stage output and cooperative therewith to produce at least one delayed output therefrom exceeding intrinsic transmission gate delay but less than said clock signal period;

d. combinational logic means directly coupled with two inputs between said stage output and said dynamic imbalance means output and an output coupled to said register data input, operative therebetween so as to produce a pseudorandom flow of binary pulses; and further,

e. whereby resistance to latchup is provided through the effective dynamic imbalance introduced by the time delay

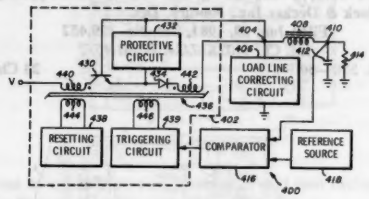
of the signal flow coupled between at least one said stage output and the said logic means.

4,348,598

POWER-PULSE SWITCHING CIRCUIT

Steve Smith, 1220 S. 49th St., Richmond, Calif. 94804

Filed Jan. 25, 1980, Ser. No. 115,498
Int. Cl.³ H03K *3/45, 3/33*
U.S. Cl. 307—300 **21 Claims**



1. A power-pulse switching circuit for conducting a pulse of current between a first and a second terminal in response to a triggering signal, said switching circuit comprising in combination:

coupling means;

a transistor including a base connected to the first terminal, an emitter and a collector;

a transformer including a collector winding having a first plurality of turns coupling said collector to the second terminal, an emitter winding having a second plurality of turns delineated by a first end connected to said first terminal and a second end coupled to said emitter by said coupling means and a saturable core coupling said collector winding to said emitter winding, said first plurality of turns being greater than said second plurality of turns whereby regenerative current feedback is provided from said collector to said emitter; and

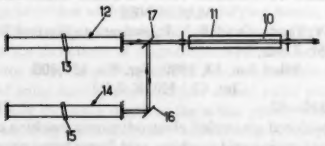
triggering means for initiating conduction of said transistor in response to said triggering signal whereby regenerative action of said transistor and said transformer cause saturation of said transistor until such time as saturation of said core occurs.

4,348,599

PROCESS AND DEVICE FOR DELIVERING A MONOCHROMATIC LIGHT BEAM BY STIMULATED SCATTERING

Francois Pradere, Soisy sur Montmorency, and Robert Frey, Paris, both of France, assignors to Centre Nationale de la Recherche Scientifique, Paris, France

Filed May 15, 1981, Ser. No. 264,095
Claims priority, application France, May 16, 1981, 80 11064
Int. Cl.³ H03F *7/00*
U.S. Cl. 307—426 **8 Claims**



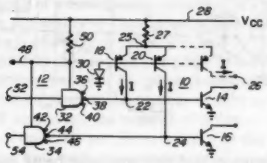
1. A process for generation of a light beam with a narrow spectrum linewidth, comprising: superimposing, in an amplifying medium exhibiting a large stimulated light emission spectrum linewidth, an energy extraction light beam having a narrow spectrum linewidth at a first frequency and a pump light beam at a second frequency, higher than said first frequency, the first frequency being contained in the stimulated emission spectrum linewidth of the medium induced by the second frequency.

4,348,600

CONTROLLED CURRENT SOURCE FOR I²L TO ANALOG INTERFACES

Robert B. Jarrett, and Wilson D. Pace, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 877,626, Feb. 14, 1978, abandoned.
This application Mar. 21, 1980, Ser. No. 132,704
Int. Cl.³ H03K *19/081;* H01L *27/04*
U.S. Cl. 307—475 **6 Claims**



1. A monolithic circuit comprising:

logic gate means including a first and second transistor of complementary conductivity type, said first transistor having an emitter region, a base region, and at least one collector region, said emitter region being coupled to a source of reference potential, said base region being coupled to an input of said logic gate means, said collector region being an output of said logic gate means, said second transistor having an emitter region, a base region and a collector region, said emitter region being coupled to a source of operating potential, said base region being formed in common with said emitter region of said first transistor, said collector region being formed in common with said base region of said first transistor;

output circuit means including a third transistor of like conductivity type as said first transistor having an emitter region, a base region and a collector region, said base region being coupled at a circuit node to said collector region of said first transistor, said emitter region being coupled to said source of reference potential and said collector region being coupled to an output circuit node; and

current source means for sourcing current to said circuit node including a fourth transistor of like conductivity type as said second transistor having a common emitter region, a base region and at least one collector region, said common emitter region being coupled to said source of operating potential, said base region receiving a bias potential thereat wherein said bias potential is different from said reference potential, said at least one collector region being coupled to said circuit node.

4,348,601

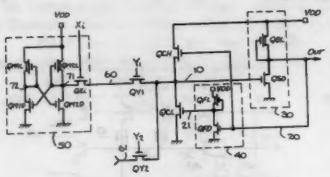
BUFFER CIRCUIT

Yoshishige Kitamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1979, Ser. No. 64,809
Int. Cl.³ G11C *7/06;* G01R *19/165;* H03K *5/24, 5/08*
U.S. Cl. 307—530 **8 Claims**

1. A buffer circuit for producing output signals of opposite phase relative to applied input signals, said buffer circuit comprising an input node; a first power source having a high potential; a second power source having a low potential; means for supplying said input node with input signals which change between high and low potential levels; a first inverter circuit including a series circuit of a load element and an input transistor, said input transistor being connected to said input node so

as to perform a switching operation in response to said input signal to produce output signals of opposite phase to said input signals, said output signals being derived from an intermediate junction between said load element and said input transistor, the level of each output signal being changed opposite to each corresponding change of input signal level; a first transistor connected between said first power source and said input node; a second transistor connected between said second power source and said input node; means for connecting a gate of said first transistor to said intermediate junction; and a second inverter having an input terminal coupled to a gate of said intermediate junction and an output terminal connected to said



second transistor, said first transistor being made conductive when said input signals change from a high to a low potential level and said output signal changes from a low to a high potential level thereby to shift the level of the potential at said input node toward that of said first power source without changing the phase of the level at said input node and said second transistor being made conductive when said input signals change from a low to a high potential level and said output signal changes from a high to a low potential level thereby to shift the level of the potential at said input node toward that of said second power source without changing the phase of the level of said input node.

4,348,602

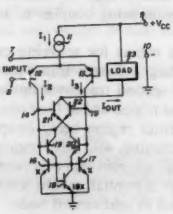
CURRENT COMPARATOR CIRCUIT WITH DEADBAND

Don R. Sauer, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 15, 1980, Ser. No. 187,007

Int. Cl.³ H03K *5/153;* **307** *291;299 B;354;360;530*

U.S. Cl. 307—530 **8 Claims**



1. A current comparator circuit with controlled deadband wherein the difference between differential currents is sensed and an output provided when said difference exceeds a predetermined value, said circuit comprising:

a pair of circuit nodes;

means for passing differential currents through said nodes;

current mirror means coupled to said nodes, said current mirror means having a common control terminal, a pair of current reflecting terminals coupled to said nodes, and deadband control means coupled to said common control terminal;

level shifting means coupled between said common control terminal and ech of said nodes; and

a pair of output transistors having their collectors commonly coupled to provide said output, their bases coupled to said nodes and their emitters cross coupled to said nodes whereby said output only occurs when said differential currents exceed a difference limit determined by said deadband control means.

4,348,603

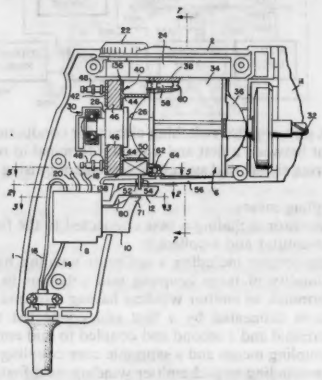
PRINTED-CIRCUIT BOARD AND TRIGGER-SWITCH ARRANGEMENT FOR A PORTABLE ELECTRIC TOOL

Siegfried Huber, Johannesberg, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Jan. 29, 1981, Ser. No. 229,452

Int. Cl.³ H02K *7/14;* **B23B** *45/2*

U.S. Cl. 310—50 **28 Claims**



1. A portable electric tool, comprising:

an electric motor capable of drivingly rotating in either of two rotational directions;

a housing having a handle and a motor compartment, said motor being contained in said motor compartment;

a printed circuit board in said motor compartment;

a first switch in said handle for energizing said tool;

a second switch comprising a discrete integral component mounted on said printed circuit board in said motor compartment; said second switch determining the rotational direction of drive of said motor; and

means, interrelating said first and second switches, for rendering said first switch inoperative until said second switch is positioned to allow said motor to be energized to drivingly rotate in either one or other of said rotational directions.

4,348,604

TOTALLY ENCLOSED AIR COOLED ELECTRICAL MACHINES

Herbert W. Thode, Oradell, N.J., assignor to General Dynamics Corp., St. Louis, Mo.

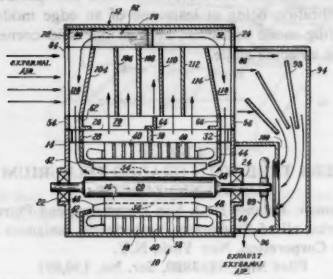
Filed Jun. 13, 1980, Ser. No. 159,408

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—62 **21 Claims**

1. An enclosed air cooled electrodynamic machine comprising a frame housing said machine, said frame being open on one side thereof, a cross flow plate heat exchanger mounted on said frame on said one side thereof, partitions between alternate pairs of the plates in said heat exchanger defining a plurality of separate ducts having opposite ends, said ducts communicating at one of said opposite ends with the interior of said frame, a baffle disposed adjacent to the other opposite ends directing the flow of internal air in opposite directions through different

ones of said ducts so that said internal air circulates through said machine and said heat exchanger where said internal air is



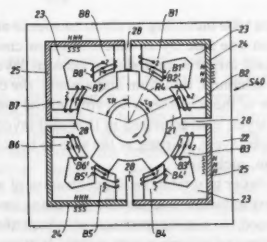
cooled by external air passing through said heat exchanger in cross flow relationship with said internal air.

4,348,605

ELECTRICAL RELUCTANCE MACHINE

Vilmos Török, Lidingö, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Mar. 19, 1980, Ser. No. 131,590
Claims priority, application Sweden, Mar. 30, 1979, 7902845
Int. Cl.³ H02K *19/06*
U.S. Cl. 310—168 14 Claims



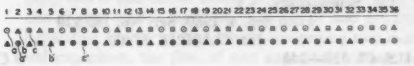
1. An electrical reluctance machine comprising at least one stator unit with an even number of mutually equal groups of salient stator poles, said groups being evenly distributed around the inner circumference of the stator unit, means for pre-magnetizing said stator poles with one and the same polarity within each of said stator pole groups, but with differing polarity from group to group around the entire stator circumference, said stator pole groups supporting a plurality of working coils, which are distributed between at least two working windings provided with individual rectifying means, said rectifying means being arranged to establish the current directions and thus the directions of magnetization of said working coils, and a rotor shaft supporting at least one rotor within said stator unit, said rotor having a plurality of salient rotor poles having substantially the same width as the stator poles, in which each of said working coils surrounds one stator pole only, the magnetization direction of each of said working coils always coincides with the direction of the pre-magnetization applied to the corresponding stator pole, and two stator poles whose working coils belong to one and the same working winding are always separated from each other in the circumferential direction of the stator by at least one intermediate stator pole which supports a working coil belonging to a different working winding.

4,348,606

POLYPHASE ARMATURE WINDINGS

Sadayoshi Hibino, Suzuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 940,603, Sep. 8, 1978. This application Jul. 30, 1980, Ser. No. 173,446
Int. Cl.³ H02K *3/00*
U.S. Cl. 310—184 2 Claims



1. An armature winding for a three-phase induction motor, said winding being of a double-layer structure of a plurality of coils placed in a plurality of slots provided in a stator core thereby forming a plurality of poles, wherein:

the number of slots (q) per pole per phase is less than $\frac{1}{3}$, said number of slots per pole per phase being represented as $z/3\times P$ where z denotes the number of slots in said stator core and P represents the number of poles;

the number of coils (Q) per phase is equal to the number of slots divided by 3, said coils being inserted in said slots and connected in such a manner that the voltage vector of each phase is completely balanced;

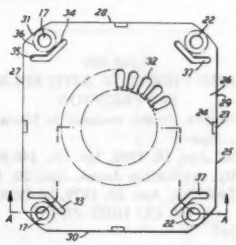
whereby at least one consequent pole occurs between the real poles.

4,348,607

ELECTRIC MOTOR, PARTICULARLY MOTOR-COMPRESSOR

Hans J. Tankred, Sonderborg; Per J. Madsen, Nordborg, and Jorgen C. Stannow, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 30,512, Apr. 16, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 239,168
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817532
Int. Cl.³ H02K *1/06*
U.S. Cl. 310—217 6 Claims



1. An electric motor and compressor assembly, comprising, a motor unit having rotor shaft and a packet of rectangularly shaped stator laminations, said laminations having an end face and at least two corners of said packet on one side of said shaft having first and second bolt holes extending through said laminations and said end face, said packet corners forming corner edges of said end face, a compressor unit having a frame member with a bearing for said shaft and two legs with planar base surface portions engaging said packet end face in respective surrounding relation to said first and second bolt holes, threaded bores in said legs in alignment with said bolt holes, threaded bolts extending through said bolt holes into said threaded bores, a slot extending through said packet and being so formed and spaced from said first bolt hole and the corresponding said corner edge if said end face so that an approximately symmetrical characteristic bending moment curve is

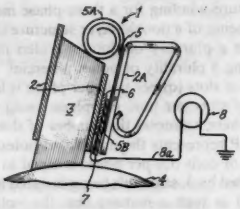
obtained along a first line passing through the axis of said first bolt hole and to both sides thereof, said planar base surface portion surrounding said first bolt hole extending in the direction of said first line only short distances to both sides of said first hole.

4,348,608

BRUSH WEAR INDICATOR

Richard N. Michael, McKean, Pa., assignor to General Electric Co., Schenectady, N.Y.

Filed Sep. 4, 1980, Ser. No. 183,920
Int. Cl.³ H02K 13/00
U.S. Cl. 310—242 9 Claims



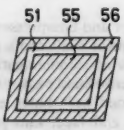
1. A brush wear indicator comprising a brush holder for supporting a brush in slidable relationship thereto, a self-winding spring having one of its ends mounted in generally fixed operative position relative to the holder and having a coiled portion that is operable to apply a biasing force to a brush supported in the holder thereby biasing one end of the brush into engagement with a rotatable electrical conductor positioned adjacent to the holder, an electrical terminal mounted in electrically isolated relationship to said one end of the spring and positioned to be contacted by the coiled portion of the spring responsive to a predetermined degree of brush wear occurring that enables the spring to wind up and move its coiled portion a given distance toward said one end of the spring, and signal means electrically connected to said terminal and operable to indicate said predetermined degree of brush wear responsive to the coiled portion of the spring contacting said terminal.

4,348,609

PIEZOELECTRIC VIBRATOR WITH SPURIOUS MODE SUPPRESSION

Jiro Inoue, Kanazawa, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 16, 1980, Ser. No. 140,848
Claims priority, application Japan, Apr. 20, 1979, 54-49280; Apr. 20, 1979, 54-49281; Apr. 20, 1979, 54-49282
Int. Cl.³ H01L 41/08
U.S. Cl. 310—367 7 Claims



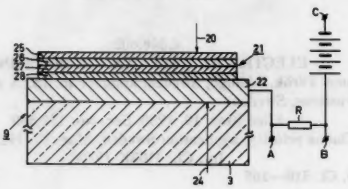
1. An expansion mode piezoelectric vibrator, comprising:
a ceramic piezoelectric plate having first and second opposed major surfaces;
first electrode means disposed on said first major surface;
second electrode means disposed on said second major surface, the position and geometry of said first and second electrode means causing said piezoelectric vibrator to vibrate primarily in an expansion mode; and
said ceramic piezoelectric plate having the shape of a quadrilateral, the four corner angles of said quadrilateral having values which cause said corner angles to cooperate to suppress at least one predetermined spurious mode of vibration of said vibrator, said at least one spurious mode of vibration being at least one of an edge mode and a bending mode vibration, at least one said corner angle being an acute angle.

4,348,610

CAMERA TUBE WITH GRADED TELLURIUM OR ARSENIC TARGET

Jan Dieleman; Joannes H. J. Van Dommelen, and Petrus J. A. M. Derks, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,891
Claims priority, application Netherlands, Apr. 11, 1979, 7902838
Int. Cl.³ H01J 29/45, 31/38
U.S. Cl. 313—386 7 Claims



1. A camera tube including an electron source and a target to be scanned on one side by an electron beam emanating from the source, said target comprising a vitreous layer containing the elements selenium, tellurium and arsenic, the concentration of at least one of these elements varying across the thickness of the vitreous layer, characterized in that said layer comprises a plurality of sub-layers, starting at the side to be scanned by the electron beam, including:
(a) a first sub-layer in which the concentration of at least one of the elements tellurium and arsenic increases, toward the side to be scanned, to a concentration at which the sum of the concentrations of tellurium and arsenic is at most 30 atomic percent;
(b) a second sub-layer; and
(c) a third sub-layer in which the concentration of at least one of the elements tellurium and arsenic is larger than its concentration in the second sub-layer;
the arsenic concentration everywhere in the vitreous layer being larger than 1.5 atomic percent.

4,348,611

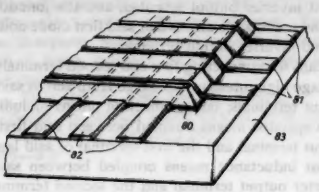
FERROELECTRIC OR PYROELECTRIC SENSOR UTILIZING A SODIUM NITRITE LAYER

Wolfgang Ruppel, Stolper Strasse 6a; Ullrich Hetzler, Machstrasse 11; Horst Vogt, Roonstrasse 17, and Peter Wurfel, Schneidemuhler Str. 24b, all of 7500 Karlsruhe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 882,796, Mar. 2, 1978, Pat. No. 4,259,365. This application Dec. 5, 1980, Ser. No. 213,649
Int. Cl.³ H01J 31/00, 31/26; G01J 1/48
U.S. Cl. 313—388 19 Claims

1. Improved ferroelectric or pyroelectric sensing element comprising
a substrate;

a crystalline sodium nitrite layer deposited on said substrate; and



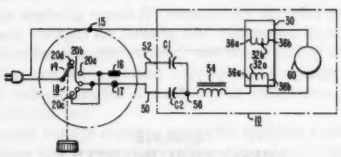
at least one electrode in contact with said crystalline sodium nitrite layer.

4,348,612

COMPACT FLUORESCENT LAMP UNIT FOR THREE-WAY FLUORESCENT LAMP FIXTURE

Edward W. Morton, Teaneck, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1981, Ser. No. 232,286
Int. Cl.³ H01J *7/44;* H05B *37/02*
U.S. Cl. 315—58 **1 Claim**



1. A compact fluorescent lamp unit for use with a three-way incandescent-lamp fixture, said fixture including an incandescent-lamp type socket comprising a generally cylindrical metallic screw-type socket member which forms a first metallic conductive member, second and third metallic conductive members mounted in the bottom portion of said socket, and a four-position switching means including first and second contacts, said switching means has a first open position, a second position in which potential is applied between said first and second metallic conductive members, a third position in which potential is applied between said first and third metallic conductive members and a fourth position in which potential is applied between said first and second metallic conductive members and said first and third metallic conductive members, and electrical conductor means adapted to connect said socket to a source of energizing potential, said compact fluorescent lamp unit comprising:

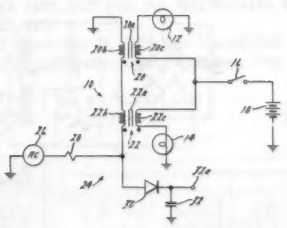
a compact fluorescent discharge device comprising an elongated vitreous bulb of predetermined configuration defining an elongated circuitous discharge path and enclosing a discharge-sustaining filling comprising mercury and inert gas and having electrodes operatively disposed proximate the ends of said defined discharge path, end cap means hermetically sealed to the ends of said bulb, each of said electrodes having lead-in members affixed to the ends thereof and sealed through said end cap means, housing and support means having an upper and a lower portion, the upper portion of said housing and support means supporting said bulb in a rigidly fixed position, the lower portion of said housing and support means having affixed thereto a screw-type base comprising a metallic shell, a glass plug affixed to the bottom portion of said metallic shell, said glass plug securing a portion of a conductive center eyelet member to fix said center eyelet member in predetermined position such that when said lamp unit is screwed into said socket, said eyelet electrically contacts said third metallic conductive member, a conductive ring member affixed to said glass plug in predetermined position and encircling said conductive center eyelet member in electrical isolation from it, said conductive ring member positioned such that when said lamp unit is screwed into said socket said ring member electrically contacts said second metallic conductive member, a ballast inductor having at least a portion thereof supported by said housing and support means, one end of said ballast inductor connected in circuit with a common electrical point and the other end of said ballast inductor connected in circuit with one of said lead-in members of a first of said electrodes, capacitive energy storage means comprising two individual capacitors, the first of said capacitors connected in circuit between said common electrical point and said second metallic conductive member, the second of said capacitors connected in circuit between said common electrical point and said third metallic conductive member, one of said lead-in members of a second of said electrodes connected in circuit with said metallic shell, the other of the lead-in members of said first and second electrodes connected in circuit with a starting means, whereby in said first switch position said ballast inductor is deenergized and said lamp unit is off; in said second switch position said first capacitor and said ballast inductor are energized and said lamp unit is in a low-light output state; in said third switch position said second capacitor and said ballast inductor are energized and said lamp unit is in a medium-light output state; and, in said fourth switch position both said first and second capacitors and said ballast conductor are energized and said lamp unit is in a high-light output state.

4,348,613

LAMP FAILURE INDICATING CIRCUIT

Ronald F. Hormel, Mt. Clemens, and Frederick O. R. Miesterfeld, Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 1, 1980, Ser. No. 192,652
Int. Cl.³ H05B *37/03*
U.S. Cl. 315—130 **3 Claims**



1. In a lamp circuit comprising a source of energizing potential, a control switch and a pair of branch circuits each containing a corresponding lamp load which are selectively connected to the power source via the switch, a failure indicating circuit in association with said lamp circuit comprising:

a pair of transformers each comprising a pair of coils;

means connecting one coil of each transformer in a corresponding one of the branch circuits and the two branch circuits together to form a complete circuit which is independent of the power source and the control switch;

means connecting the other coil of each transformer in series with each other;

and means applying a test signal to the last mentioned series circuit and monitoring its response whereby to provide an indication of a failure in either or both branch circuits.

4,348,614

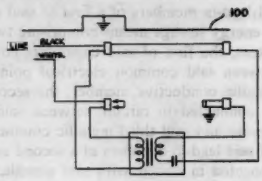
NON-LIGHT PRODUCING SUBSTITUTE APPARATUS FOR USE IN PLACE OF PHOSPHOR EXCITABLE LAMPS

David Burgess, 1341 W. 130th St., Gardena, Calif. 90247

Continuation-in-part of Ser. No. 73,223, Sep. 7, 1979, Pat. No. 4,255,692. This application Jan. 28, 1980, Ser. No. 116,288

Int. Cl.³ H05B 41/16

U.S. Cl. 315—189 28 Claims



1. A lamp substitute as a replacement for a phosphor energizable lamp in a plural lamp fixture with a pair of spaced apart sockets for each lamp and adapted to receive end terminals on said lamps, said lamp substitute comprising:

(a) a housing having a length substantially less than the distance between said sockets,

(b) a power factor compensating element in said housing and adapted to have one electrode operatively electrically connected to one of said sockets, and

(c) a ground conductor connected to another electrode of said power factor compensating element and adapted to be grounded to the same ground potential as said fixture.

4,348,615

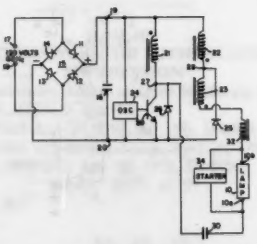
DISCHARGE LAMP OPERATING CIRCUIT

Robert L. Garrison, Henniker, N.H., and Harold L. Rothwell, Jr., Rowley, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 1, 1980, Ser. No. 164,866

Int. Cl.³ H05B 37/02

U.S. Cl. 315—219 8 Claims



1. An operating circuit for a high intensity discharge lamp, said circuit comprising, in combination:

a DC power source having first and second output terminals;

a first inductance means and a controlled switch means series-connected in that order between the first and second output terminals of said DC power source;

a second inductance means and a first diode series-connected in that order between the first and second output terminals of said DC power source, said second inductance means being transformer-coupled to said first inductance means;

an oscillator coupled to said a controlled switch means for respectively operating the same at predetermined intervals, whereby said controlled switch means and first and second inductance means function as an inverter having and AC output across the combination of said first and second inductance means, the junction of said first inductance means and said controlled switch means comprising a first inverter output terminal, and the junction of said second inductance means and said first diode comprising a second inverter output terminal;

and means for connecting first and second terminals of a low wattage high intensity discharge lamp across said inverter output terminals; said connecting means including a ballast capacitor means coupled between said first inverter output terminal and the first terminal of said lamp, and a ballast inductance means coupled between said second inverter output terminal and the second terminal of said lamp;

said ballast inductance means being selected to resonate with said ballast capacitor means at a frequency having a half period which coincides with the on-time of said controlled switch means whereby the switching current waveform is substantially a half sinewave pulse, with both the turn-on and turn-off transition of said switching means occurring at zero current, thereby substantially eliminating switching losses, said ballast inductance means being operative during the conducting period of said switch means to provide an impedance load in the lamp circuit for permitting full conduction of said switch means with a minimized power loss.

4,348,616

PRESET LIGHTING DEVICE

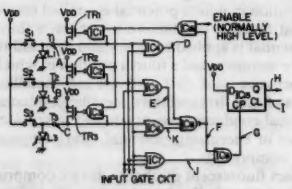
Kazuyuki Tanaka, Yamanashi; Yoshiharu Ueki, Kawagoe; Yoshiro Kunugi, Kawagoe, and Shozaburo Sakaguchi, Kawagoe, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 28, 1981, Ser. No. 229,213

Claims priority, application Japan, Nov. 15, 1979, 54-158379

Int. Cl.³ H05B 37/02

U.S. Cl. 315—314 5 Claims

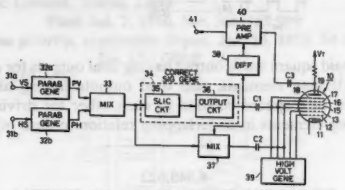


1. A preset lighting device comprising: input switches and output lighting elements connected to be activated by corresponding ones of said input switches, each of said input switches and output lighting elements being connected to a corresponding terminal commonly used for input and output; a plurality of latch circuits, one of said latch circuits being provided for latching an input applied to the corresponding one of said terminals, each said latch circuit being connected to a corresponding lighting element; a first gate circuit operatively coupled to said common terminals for detecting a state of duplicate switching when more than a single switch is activated; and a second gate circuit operative to turn off at least a predetermined one of said output lighting elements in response to an output of said first gate circuit indicative of duplicate switching and to turn on an element corresponding to one of said switches which has been activated.

4,348,617
IMAGE PICKUP DEVICE

Kenichi Miyazaki, Sagamihara; Tadayoshi Miyoshi, Yokohama; Itsuo Takanashi, Yokohama; Shintaro Nakagaki, Yokohama; Koichiro Motoyama, Ninomiya, and Sumio Yokokawa, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 29, 1980, Ser. No. 201,735
Claims priority, application Japan, Oct. 31, 1979, 54/141069
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—370 **8 Claims**



1. An image pickup device comprising:

an image pickup tube having a target scanned by an electron beam and a pair of electrodes which form a collimation;

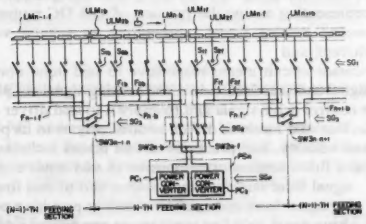
voltage applying means for respectively applying predetermined voltages for forming said collimation to said collimation forming electrodes of said image pickup tube, said collimation being formed responsive to a voltage ratio of said voltage applied to each of said collimation forming electrodes; and

correction voltage applying means for applying a correction voltage which varies said voltage ratio of said collimation forming electrodes to one of said collimation forming electrodes, upon scanning of the peripheral parts of an effective scanning surface of said target by said electron beam.

4,348,618
FEEDING SYSTEM FOR LINEAR MOTOR TYPE TRANSPORTING SYSTEM

Kiyoshi Nakamura, Katsuta, and Masayoshi Isaka, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1980, Ser. No. 132,641
Claims priority, application Japan, Mar. 28, 1979, 54-36692
Int. Cl.³ H02K *41/03*; B60L *15/22*
U.S. Cl. 318—38 **32 Claims**



1. A feeding system for a linear motor transportation system having a number of discrete drive coil units or linear motor units serially arranged along a track to generate a moving magnetic field for driving vehicles, said feeding system comprising:

a number of feeding sections serially contiguously extending along said track, said linear motor units being assigned to said feeding sections;

at least one power supply station arranged at each of said feed sections;

each of said feeding sections being divided into at least two linear motor blocks so as to extend serially contiguously along said track;

two feeder means arranged respectively corresponding to said at least two linear motor blocks in each of said feeding sections;

a first group of switch means, each of the linear motor units belonging to one of said two linear motor blocks of each of said feeding sections being connected to the associated one of said two feeder means through a corresponding one of said first group of switch means, and each of the linear motor units belonging to the other of said two linear motor blocks being connected to the other of said two feeder means through a corresponding one of said first group of switch means;

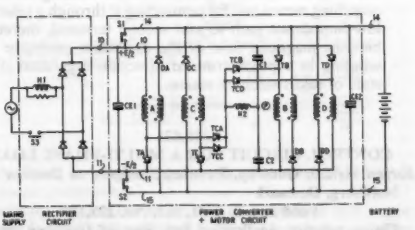
a second group of switch means, each of said two feeder means arranged in each of said feeding sections being connected to the associated power supply station through corresponding ones of said second group of switch means; and

means for controlling said second group of switch means in a manner so that at least one of said second group of switch means connected to a corresponding one of said linear motor blocks through a corresponding one of said feeder means and corresponding ones of said first group of switch means is closed when a vehicle exists within said corresponding one linear motor block and that when before another vehicle succeeding said first mentioned vehicle enters a linear motor block backwardly adjacent to said corresponding one linear motor block at least another one of said second group of switch means connected to said backwardly adjacent linear motor block is opened at latest before said succeeding vehicle enters said backwardly adjacent linear motor block.

4,348,619
VARIABLE RELUCTANCE ELECTRIC MOTOR SYSTEMS

William F. Ray, Nottinghamshire, and Rex M. Davis, Loughborough, both of England, assignors to Chloride Group Limited, London, England

PCT No. PCT/GB79/00083, § 371 Date Dec. 13, 1979, § 102(e) Date Dec. 13, 1979, PCT Pub. No. WO79/01134, PCT Pub. Date Dec. 27, 1979
PCT Filed May 25, 1979, Ser. No. 187,838
Claims priority, application United Kingdom, May 26, 1978, 22890/78
Int. Cl.³ H02P *5/00*
U.S. Cl. 318—139 **16 Claims**



1. A variable reluctance electric motor system including a variable reluctance motor having main windings and auxiliary windings closely coupled to the main windings, a main storage battery for driving the motor, D.C. supply terminals, and a power converter circuit for charging the battery from an external D.C. supply, in which the motor is included in the power converter circuit to function as an isolating transformer to isolate the battery from the supply when on charge, and

including switch means for disconnecting the battery from the main windings during charging.

4,348,620

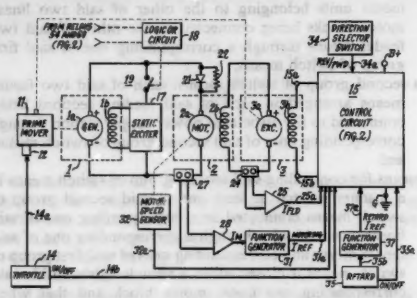
MAGNETIC FIELD PRESETTING CIRCUIT FOR AN EXCITER FIELD WINDING IN AN ELECTRICAL PROPULSION SYSTEM FOR TRACTION VEHICLES

Martin Simon, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Sep. 15, 1980, Ser. No. 187,126

Int. Cl.³ H02K *23/00*

U.S. Cl. 318—154 **8 Claims**



1. In a propulsion system for a traction vehicle including a separately excited d-c motor having an armature and a field winding, means for supplying d-c electric power to the armature of said motor, and an excitation generator having both an armature connected across said motor field winding and an excitation generator field winding, an improved control circuit for the excitation generator field winding comprising:

(a) first and second voltage supply terminals adapted to be connected to a d-c electric power source so that the potential on said first terminal differs from that on said second terminal;

(b) first means for connecting one end of said excitation generator field winding to said first terminal;

(c) second means including controllable switching means for connecting the other end of said excitation generator field winding to said second terminal, said switching means in normal operation being periodically switchable between conducting and non-conducting states;

(d) means for producing an acceleration command signal when movement of the vehicle from rest is desired; and

(e) acceleration relay means responsive to said acceleration command signal for temporarily disconnecting said other end of said excitation generator field winding from said switching means and for connecting it through a relatively low impedance path to said second terminal, thereby to bias the magnetic field of the excitation generator field winding in a predetermined direction regardless of the state of said switching means.

4,348,621

CONTROL CIRCUIT FOR A MULTI-PHASE LOAD

Jorgen Hyldal, Guderup, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

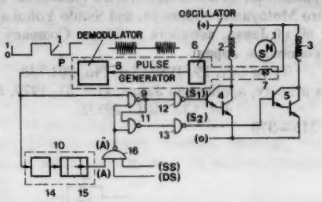
Filed Jan. 2, 1981, Ser. No. 222,128

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 3000403

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—254 **2 Claims**

1. A DC motor assembly comprising, a permanent magnet rotor, a pair of poles, parallel circuit branches having a pair of windings with a common positive terminal connection for a DC voltage source, a pair of controllable switching elements in said branches in respective series with said windings, detector means for detecting the angular position of said rotor, pulse generating means responsive to said detector means forming a symmetrical square wave output for switching said switching elements on and off in a push-pull mode, drive means responsive to said square wave output having dual outputs for driving said switching elements, said dual outputs having alternate pulses in time spaced relation to each other for driving said switching elements in underlapping relation to each other.



4,348,622

DC MOTOR DRIVE CONTROL SYSTEM

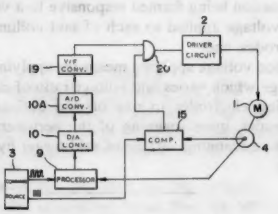
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 28, 1979, Ser. No. 52,780

Claims priority, application Japan, Jul. 1, 1978, 53-80198; Oct. 24, 1978, 53-131381

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—318 **7 Claims**



1. A DC motor drive control system, comprising:

a driver circuit for energizing a DC motor;

a command source for applying an input command signal comprising a first pulse train to said driver circuit to cause said motor to rotate in accordance therewith;

single encoder means coupled with said DC motor so as to respond to an angular displacement thereof for providing a first sensing signal comprising a second pulse train and representing an angular position of said DC motor and a second sensing signal representing an angular velocity thereof; and

processor circuit means responsive to said input command signal and said first and second sensing signals to produce a control drive signal and to apply it to said driver circuit so that said motor is driven controlledly as to its position and velocity, said processor circuit means including:

(a) a first comparator responsive to said input command signal from said command source and to said first sensing signal from said encoder means to provide a position drive signal, said first comparator comprising a differential counter responsive to said first and second pulse trains to produce differentiated digital pulses;

(b) a digital-analog converter connected to said first comparator for converting said digital pulses to an analog signal;

(c) a frequency-voltage converter responsive to said second pulse train to produce a voltage signal representing the frequency thereof;

(d) a differential amplifier constituting a second compara-

tor and responsive to said analog signal and said voltage signal to produce a differentiated voltage signal; and

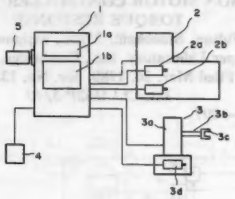
(e) a voltage-frequency converter for transforming said differentiated voltage signal to a third pulse train constituting said control drive signal.

4,348,623

NUMERICAL CONTROL SYSTEM FOR CONTROLLING BOTH A MACHINE TOOL AND A ROBOT

Kengo Kobayashi, Kawasaki; Hajimu Inaba, Hino, and Shinsuke Sakakibara, Kunitachi, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 165,989
Claims priority, application Japan, Jul. 10, 1979, 54-87319
Int. Cl.³ G05B *19/42*
U.S. Cl. 318—568 **11 Claims**



1. A numerical control system comprising:

a numerical control device having a robot control function and a numerical control function;

a machine tool, controlled by said numerical control device in accordance with the numerical control function, for machining a workpiece; and

a robot for executing prescribed tasks in cooperation with said machine tool;

a teaching control panel, coupled to said numerical control device, for teaching robot operation by providing the robot command data from said teaching control panel; and

an interface circuit, operatively connected between said numerical control device and said robot, for administering the exchange of data therebetween;

said numerical control device including control means for controlling said robot in accordance with the robot control function, and memory means for storing machine tool command data and the robot command data supplied by said teaching control panel;

the machine tool command data and robot command data being successively read out of said memory means to actuate said machine tool and said robot;

said robot being instructed by the robot command data through said interface circuit to execute a prescribed task.

4,348,624

THERMAL SERVO SYSTEM FOR MECHANICAL POSITIONING

Harold M. Anderson, Rancho Palos Verdes; Norman E. Marcum, Laguna Beach, and Wilbur E. DuVall, Victorville, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1980, Ser. No. 126,736
Int. Cl.³ G05D *23/275*
U.S. Cl. 318—634 **2 Claims**

1. A thermally controlled servo system for achieving accurate positioning of a member, comprising:

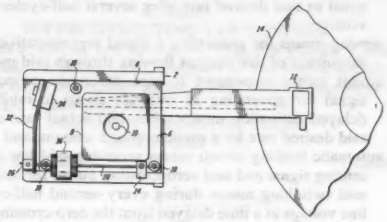
a support member having a fixed position;

a positioning member supported by said support member in a manner that permits said positioning member to have limited movement relative to said support member;

an elongated member supported by said support and positioning members, said elongated member being capable of supporting an electrical current and changeable in length in response to changes in its temperature due to changes in the magnitude of said electrical current; and

control means for varying the magnitude of said electrical current in response to an error signal representing incorrect positioning of said positioning means;

said control means including memory means for generating a digital representation of the magnitude of the electrical current to be passed through said elongated member to correct said incorrect positioning, a digital power amplifier including a plurality of gates which receive said digital representation and an alternating current reference signal and a plurality of summing resistors for providing at the output of the digital power amplifier a current



summed analog signal having a magnitude equal to a multiple of the currrent to be passed through said elongated member, and an inductor including tuned circuit coupled to said power amplifier and tuned to the frequency of said reference signal;

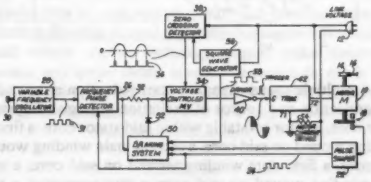
the inductor of said tuned circuit surrounding said elongated member, said inductor and said elongated member comprising a transformer whereby a constant current signal, stepped up by the ratio of turns of said inductor to said elongated member, is generated in said elongated member to provide changes in the temperature and length of said elongated member to thereby correct the position of said positioning member.

4,348,625

VARIABLE SPEED MOTOR SYSTEM

Paul H. Sharp, Pasadena, Calif., assignor to Marmon Company, Chicago, Ill.

Filed Dec. 21, 1979, Ser. No. 105,952
Int. Cl.³ H02P *3/18*
U.S. Cl. 318—757 **8 Claims**



2. A circuit for controlling the rate of rotation of a shaded-pole motor comprising:

means for sensing the actual rate of rotation of said motor and for generating a signal having at least one parameter proportional to said actual rate;

means for selecting a desired rate of rotation of said motor and for generating a signal having at least one parameter proportional to said desired rate;

means responsive to said actual and desired rate proportional signals for generating a signal having at least one parameter proportional to the difference between said actual and desired rates;

a source of line power connected to said motor;

means for sensing the zero-crossing points of the AC voltage of said line power and for generating a pulse at each zero-crossing point;

switching means connected in series between said source of power and said motor for applying line current to said motor during a portion of each half-cycle of line voltage;

delayed activation means responsive to said zero-crossing pulse and said difference proportional signal and having an output signal for activiating said switching means to apply line current to said motor during a portion of each half-cycle of line voltage at a time delayed from the zero-crossing point of said line voltage, the amount of said time delay being dependent on said difference proportional signal, said applied line current renders said actual rate equal to said desired rate after several half-cycles of line voltage;

sensing means for generating a signal representative of the magnitude of line current flowing through said motor;

inhibit means responsive to said difference proportional signal for generating an override signal to inhibit said delayed activation means when said actual rate exceeds said desired rate by a predetermined amount; and

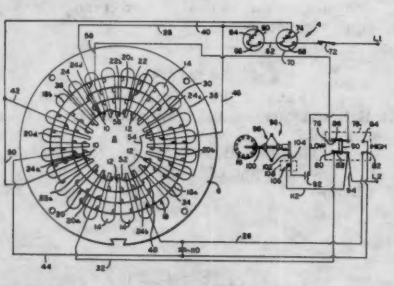
automatic braking circuit means receiving said line current sensing signal and said zero-crossing pulses for activating said switching means during every second half-cycle of line voltage at a time delayed from the zero-crossing point of said line voltage to produce a variable half-wave direct braking current in said motor.

4,348,626

TWO-SPEED SINGLE PHASE MOTOR WITH CENTRIFUGAL SWITCH

Solomon London, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 16, 1980, Ser. No. 187,757
Int. Cl.³ H02P *1/18*
U.S. Cl. 318—772 **18 Claims**



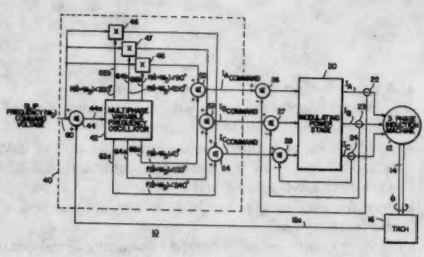
1. A multiple speed capacitor start induction motor adapted for connection to a source of excitation voltage comprising: a stator core, a rotor rotatable within said stator core, a first main winding wound on said core, a second main winding wound on said core, a first start winding wound on said core, a second start winding wound on said core, a start capacitor, a pair of terminals adapted to be connected to the source of excitation voltage, a double pole double throw selector switch means having first and second switch elements movable between a high speed position and an alternative low speed position for connecting said first main winding in parallel across said terminals and said first start winding in parallel across said terminals and said starting capacitor in series with said first start winding while at the same time disconnecting said second main winding and said second start winding from across said terminals when in its said high speed position and for connecting said second main winding in parallel across said terminals and said second start winding in parallel across said terminals and said start capacitor in series with said second start winding while at the same time disconnecting said first main winding and said first start winding from across said terminals when in its said low speed position, one of said first and second switch elements being connected in series with said start capacitor and the other of said first and second elements being connected with one of said terminals, a single pole single throw centrifugally actuated switch means associated for conjoint rotation with said rotor and having a single contact pair connected in series with said start capacitor and one of said one terminal and the other of said terminals, said centrifugally actuated switch means electrically disconnecting said start capacitor from said one of said one terminal and said other terminal when said rotor exceeds a predetermined rotational speed, and a run capacitor connected in series with at least one of said first and second start windings.

4,348,627

INDUCTION MOTOR CONTROLLER WITH RAPID TORQUE RESPONSE

Donald E. Fulton, Stoneham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 24, 1980, Ser. No. 133,414
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—807 **7 Claims**



1. A controller for an induction motor having an output shaft, comprising:

means for receiving a slip frequency command signal representative of a desired slip frequency for said motor, w_s,

means for receiving a shaft frequency signal representative of the rate of rotation of said shaft, θ,

oscillator means responsive to said slip frequency command signal and said shaft frequency signal, said oscillator including means for generating at least one pair of associated signals, wherein the associated signals of each of said pairs have frequencies proportional to the sum of said desired slip frequency and said shaft rotation rate, $\theta + w_s$, and are in phase quadrature,

weighting means for amplitude scaling only one signal of each of said pairs of signals by a factor proportional to said desired slip frequency,

adding means for generating stator command signals representative of the sum of each of said amplitude scaled signals and its associated quatrature signal.

4,348,628

ELECTRIC MOTOR ALTERNATING POWER SUPPLY FOR VEHICLES

Carl C. Loucks, 3009 Harding Way, Costa Mesa, Calif. 92626

Continuation-in-part of Ser. No. 161,609, Jun. 20, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,427
Int. Cl.³ H02J *7/00*
U.S. Cl. 320—61 **5 Claims**

1. An electric power-supply system for powering a vehicle having an electric motor, comprising:

an electric motor adapted to be energized by DC-current flow;

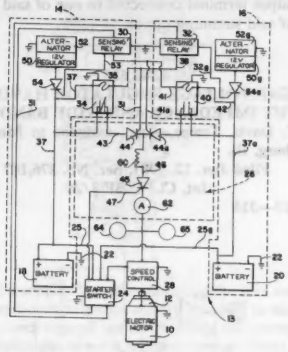
a speed-control means operably connected to said motor to regulate the rotational speed of said motor;

a first alternating circuit including a first battery and a first sensing-relay means;

a second alternating circuit including a second battery and a second sensing-relay means, wherein said first and second alternating circuits are integrated with each other, whereby said sensing relays determine the charge or discharge mode of a given alternating circuit;

a control circuit interconnected to said first and second alternating circuits, and interconnected between said speed-control means and said alternating circuits; and

a starter switch connected to said speed-control means, and



to said first and second batteries of said first and second circuits; and

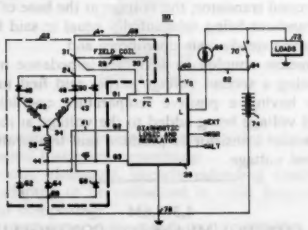
wherein said first sensing-relay means is interconnected to said second alternating circuit; and said second sensing-relay means is interconnected to said first alternating circuit, wherein said first sensing-relay means is adapted to sense the voltage output of said second battery to selectively provide a charge or discharge mode of said second alternating circuit; and wherein said second sensing-relay means is adapted to sense the voltage output of said first battery to selectively provide a charge or discharge mode of said first alternating circuit.

4,348,629

STATOR FAULT DETECTOR FOR AUTOMOTIVE ALTERNATOR BATTERY CHARGING SYSTEMS

Kirk A. Sievers, Roselle, Ill., assignor to Motorola, Inc., Fort Lauderdale, Fla.

Filed May 22, 1980, Ser. No. 152,224
Int. Cl.³ G01R *31/00*; G08B *21/00*
U.S. Cl. 322—99 **7 Claims**



1. In a multiphase alternator battery charging system, said alternator producing a rectified electrical signal for charging said battery, a detector monitoring the function of the stator and rectifying diodes of said alternator comprising:

means coupled between said stator and said rectifying diodes, combining the individual phase signals of said alternator to produce a normally symmetric wave signal representative of the proper performance of said stator and diodes in said alternator;

first and second comparison means coupled to said combining means, said first comparison means detecting deviations in said normally symmetric wave signal greater in magnitude than a first threshold value, and said second comparison means detecting deviations in said normally symmetric wave signal lesser in magnitude than a second threshold value; and

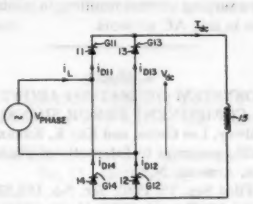
means producing an output signal whenever said normally symmetric wave signal deviates above said first threshold value or below said second threshold value.

4,348,630

SUPERCONDUCTING VAR CONTROL

Heinrich J. Boenig, Los Alamos, N. Mex., and William V. Hassenzahl, Piedmont, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 5, 1980, Ser. No. 213,275
Int. Cl.³ G05F *1/70*
U.S. Cl. 323—207 **7 Claims**



1. Static VAR control means comprising:

a superconducting coil; and

a single phase asymmetrical full wave Graetz bridge connected in parallel with said superconducting coil and adapted for connection to an ac power source, said Graetz bridge having first, second, third and fourth silicon controlled rectifiers connected in a bridge rectifier configuration having first and second opposing terminals adapted for connection to a single phase ac line;

a gate electrode on each of said first, second, third, and fourth silicon controlled rectifiers;

said superconducting coil connected to third and fourth opposing terminals on said bridge; and

circuit means connected to said gate electrodes enabling conduction of said silicon controlled rectifiers whereby current flowing in said superconducting coil is constant, said circuit means including trigger pulse generating means and pulse delay means connected in circit with each of said gate electrodes, said trigger pulse generating means adapted for connection to a single phase ac line.

4,348,631

STATIC VAR GENERATOR

Laszlo Gyugyi, Penn Hills, and Peter Wood, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 4, 1981, Ser. No. 270,470
Int. Cl.³ H02J *3/18*
U.S. Cl. 323—211 **1 Claim**

1. A static var generator, comprising:

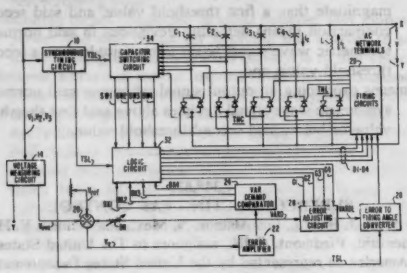
(a) a reactance means disposed for connection into an AC network;

(b) a monitoring means for monitoring the reactive requirements of said AC network;

(c) a control means connected to said reactance means and said monitoring means for connection of said reactance

means into said AC network in response to the reactive requirements of said AC network; and

(d) an error adjusting circuit in combination with said control means disposed to predetermine an amount of capacitive surging current and connect an inductive reactance in synchronism with capacitive reactance to suppress said capacitive surging current resulting in minimizing voltage transients in said AC network.

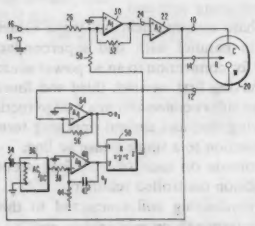


4,348,632

SERVOSYSTEM OPERATING ABOUT NOISE COMPONENT ERROR SIGNAL

Ronald K. Galwey, Los Gatos, and Kay K. Kanazawa, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,120
Int. Cl.[3] G05F *1/56;* C25B *15/00;* C25D *21/00*
U.S. Cl. 323—280 10 Claims



1. A closed loop servocircuit arrangement for controlling the operation of an electric circuit element having at least two terminals, comprising

circuitry for controlling and applying operating energy across said electric circuit element for passing electric current therethrough, which electric current includes an inherent electric noise current component which also manifests an electric noise potential,

servocircuitry having input terminals coupled to points on said circuitry at which said noise current component and said noise potential components are manifested and having an output terminal at which a processed error signal is presented and combined with said operating energy for controlling the flow of electric current through said electric circuit element,

said servocircuitry comprising

an inverting summing circuit having balanced input terminals and having an output terminal,

a control amplifying circuit having an input terminal connected to said output terminal of said summing circuit, and having an output terminal connected to one terminal of said electric circuit element,

a current following circuit having an input terminal connected to the other terminal of said electric circuit element and having an output terminal,

a converting circuit having an input circuit connected to said output terminal of said control amplifying circuit and having an output terminal,

an integrating circuit having an input terminal connected to said converting circuit and having an output terminal, and

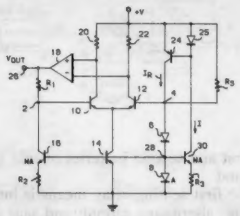
a multiplying circuit having input terminals individually connected to said output terminals of said current following circuit and said integrating circuit and having a product output terminal connected to one of said input terminals of said summing circuit.

4,348,633

BANDGAP VOLTAGE REGULATOR HAVING LOW OUTPUT IMPEDANCE AND WIDE BANDWIDTH

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1981, Ser. No. 276,147
Int. Cl.[3] G05F *3/20*
U.S. Cl. 323—314 8 Claims



1. A solid state voltage supply for generating a temperature compensated voltage at an output node thereof, comprising:

first and second emitter coupled differential transistors each having base, emitter and collector terminals, the base of said first transistor adapted to be coupled to a first voltage having a negative temperature coefficient;

circuit means coupled to the collectors of said first and second transistors for furnishing a first supply voltage thereto to develop current flow therethrough;

current sinking means coupled to the emitters of said first and second transistors;

first means responsive to differential currents flowing through said first and second transistors and having an output coupled to said output node;

first impedance means having a first terminal coupled to said output node and a second terminal coupled to the base of said second transistor, the voltage at the base of said second transistor being substantially equal to said first voltage during steady state conditions; and

second means coupled to said first impedance means for producing a second voltage across said first impedance means having a positive temperature coefficient, said second voltage being added to the voltage at the base of said second transistor to produce said temperature compensated voltage.

4,348,634

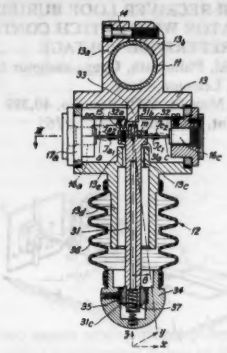
MANUAL CONTROL MEANS FOR CONTROLLING THE MOVEMENTS OF A MOTOR-DRIVEN ELEMENT

Roger J. P. David, Essonne, and Maurice A. Lande, Paris, both of France, assignors to Association des Ouvriers en Instruments de Precision, Paris, France

Filed Jul. 30, 1980, Ser. No. 173,454
Claims priority, application France, Aug. 2, 1979, 79 19844
Int. Cl.[3] G05B *24/02*
U.S. Cl. 323—353 8 Claims

1. A manual control means for controlling the movements of

a motor-driven element in three perpendicular directions, said means comprising a deformable diaphragm in the form of a cross including a central portion and projecting arms, the central portion of which is subjected to the action of a manually displaceable handle acting on the said central portion, a pair of strain gauges secured one on each of the two faces of



each arm, and a support means connecting the free end of each arm of the diaphragm to means solidly attached to the element to be moved, said support means enabling the corresponding arm of the diaphragm to turn, without torsion, about its longitudinal axis when the handle is subjected to a force applied in the direction perpendicular to said axis.

4,348,635

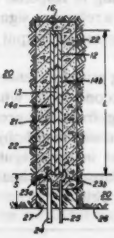
DETECTING AND MEASURING THE POSITION OF A BREAK IN SOLID FORMATIONS BY MEASURING THE CAPACITANCE OF AN ENLONGATED ELEMENT EMBEDDED THEREIN

David Wright, Vershire, Vt., and Ivor Hawkes, Hanover, N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 867,393, Jan. 6, 1978, abandoned. This application Nov. 23, 1979, Ser. No. 97,107

Int. Cl.³ G01B *7/22*; G01R *31/08*; G01L *1/14*

U.S. Cl. 324—52 **11 Claims**



1. An apparatus for determining the position of a structural break in a solid formation comprising:

a continuous, elongated, linearly extending electrical element adapted to be embedded in solid formation, said element comprising;

two flat continuous, elongated, linearly extending frangible conductive tape means for conducting an electric current and storing an electric charge and adapted to be connected to a capacitance measuring instrument;

a flat continuous, elongated, linearly extending dielectric paper tape disposed intermediate said two flat continuous, elongated, linearly extending frangible conductive tape means with one said flat continuous, elongated, linearly extending frangible conductive tape means abutting the first surface of said flat continuous, elongated, linearly extending flexible dielectric paper tape along said flat continuous, elongated, linearly extending flexible dielectric paper tape length and another said flat continuous, elongated, linearly extending frangible conductive tape means abutting the second surface of said flat continuous, elongated, linearly extending flexible dielectric paper tape along said flat continuous, elongated, linearly extending flexible dielectric paper tape length whereby the electrical capacitance formed between said two flat continuous, elongated, linearly extending frangible conductive tape means is a function of the length of said flat continuous, elongated, linearly extending frangible conductive tape means and;

grouting means surrounding said electrical element rigidly embedding said electrical element in such solid formation, whereby a fracture in said grouting means due to structural break in the solid formation causes a severing of said flat continuous, elongated, linearly extending frangible conductive tape means in close proximity to said fracture and wherein the location at which said severing occurs may be determined by the capacitance measured between said two flat continuous, elongated, linearly extending frangible conductive tape means by said capacitance measuring means.

4,348,636

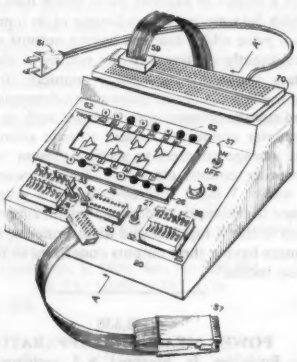
INTEGRATED CIRCUIT TESTER

George J. Doundoulakis, 2498 Kayron La., North Bellmore, N.Y. 11710

Filed Jul. 9, 1980, Ser. No. 167,136

Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 R **10 Claims**



1. An integrated circuit tester comprising:

a test socket means, having a predetermined number of pin stations for receiving an I.C. chip to be tested;

logic state electronic detection means for detecting the logic state of each pin of said test socket means;

luminous display means, driven by said logic state electronic detection means, for continuously indicating the logic state of pins;

display card means, providing a logic diagram and showing the number and logic significance of each pin of the chip under test;

display card supporting and positioning means for supporting and adjustment of said display card means, so that it can register next to said luminous display means, thereby providing correlation of the displayed logic states with the inherent logic operation of the chip under test;

logic state adjusting means for setting a predetermined combination of pins of said test socket means to a logic value

of "1" and "0", depending on the logic function and mode of operation of the chip under test.

logic state pulsating means for temporarily switching the logic state of any combination of pins, of said test socket means, between the logic states "1" and logic state "0", and,

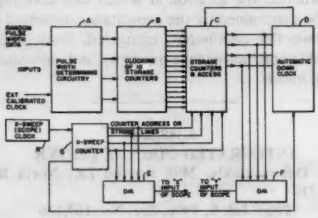
power supply switching means for providing the power requirement of the chip under test such as ground and operating voltage to appropriate pins.

4,348,637

PULSE WIDTH SPECTRUM ANALYZER

Frank Hayes, III, Huntsville, and Joseph R. McGinty, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 10, 1980, Ser. No. 205,359
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 B **8 Claims**



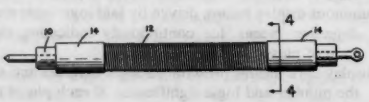
1. A pulse width spectrum analyzer for analyzing the pulse widths of a source of random pulse width data comprising a pulse width determining means having as its input said source of random pulse width data and having outputs whose magnitudes are directly portional to the widths of the input pulse width data; a plurality of storage counters; first means for directing the outputs of said pulse width determining means to a selected storage counter in accordance with its magnitude; a sweep counter connected to said storage counters so as to cause the storage counters to serially present outputs as the sweep counter counts; electronic display means having an X-input and a Y-input for representing a graph display in accordance to its inputs; said sweep counter having its output connected to the X-input of said display means; and said storage counters having their outputs connected to the Y-input of the display means.

4,348,638

POWER MEASURING APPARATUS

Austin G. Boldridge, Jr., Freehold, N.J., assignor to Conversational Systems, Inc., New York, N.Y.

Division of Ser. No. 925,105, Jul. 17, 1978, Pat. No. 4,236,112. This application Apr. 24, 1980, Ser. No. 143,377
Int. Cl.³ G01R *1/20*; H01F *27/30*
U.S. Cl. 324—127 **1 Claim**



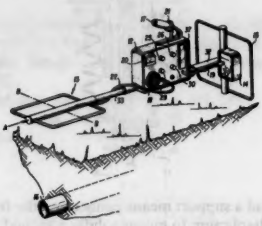
1. A transformer secondary winding comprising: a flexible hollow tube of dielectric material; a multiturn wire winding wound around the peripheral surface of said hollow tube; fastening means for interconnecting the ends of said hollow tube, said fastening means comprising a tape of flexible dielectric material passing through said hollow tube and extending beyond the ends thereof; and an integrated circuit amplifier affixed to said hollow tube and electrically connected to said winding.

4,348,639

TRANSMITTER-RECEIVER LOOP BURIED METAL OBJECT LOCATOR WITH SWITCH CONTROLLED REFERENCE VOLTAGE

James P. Karbowski, Philomath, Oreg., assignor to Triple Dee Electronics Inc., Lebanon, Oreg.

Filed May 18, 1979, Ser. No. 40,399
Int. Cl.³ G01V *3/11, 3/165*
U.S. Cl. 324—329 **8 Claims**



8. An apparatus for locating a buried metal object comprising:

first and second rectangular loops, said loops being spaced apart and lying in perpendicular planes;

means for energizing said first loop with an alternating current;

means for detecting a signal induced in said second loop in response to an electromagnetic field generated by said metal object when in the presence of said first loop;

comparator means for detecting the difference between the magnitude of a signal induced in said second loop and the magnitude of a reference signal and providing at an output thereof a voltage indicating said difference;

means connected to said comparator means output for supplying a reference signal having a selectable magnitude to said comparator means, said means including a switch, said means providing in response to the momentary closure of said switch a reference signal voltage for establishing the comparator means output voltage to a predetermined level; and

means for monitoring said difference during the positioning of said first and second loops whereby increases in said difference resulting from the proximity of said second loop with respect to said metal object may be reduced by successive increases in the magnitude of said reference signal until said loops are optimally positioned with respect to said metal object.

4,348,640

DIVIDE BY THREE CLOCK DIVIDER WITH SYMMERTICAL OUTPUT

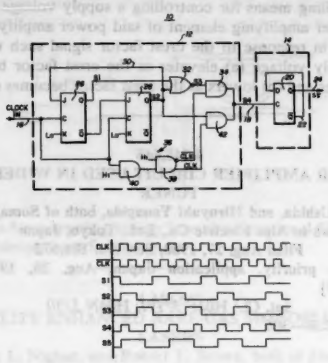
Steven J. Clendening, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 25, 1980, Ser. No. 190,682
Int. Cl.³ H03K *21/00*
U.S. Cl. 328—41 **8 Claims**

1. A divide by three digital clock divider circuit providing a symmetrical output, comprising:

a divide by one and one-half circuit comprising flip-flop means and gate means for receiving clock pulses of frequency F and generating nonsymmetrical pulses of frequency ⅔F, and for gating said clock pulses with said

nonsymmetrical pulses and generating pulses of frequency ⅗F; and



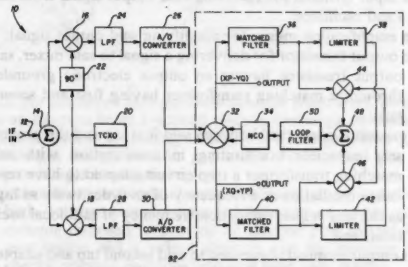
divide by two means receiving said pulses of frequency ⅗F and outputting symmetrical pulses of frequency ⅕F.

4,348,641

DIGITAL BASEBAND CARRIER RECOVERY CIRCUIT

Lex A. Scott, Huntsville, Ala.; William H. Mosley, Jr., St. Petersburg, and Carl F. Andren, Indiatlantic, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jan. 8, 1980, Ser. No. 110,462
Int. Cl.³ H03D *3/00*; H03K *9/00*
U.S. Cl. 329—50 **18 Claims**



1. A circuit for demodulating a data modulated signal that includes a data signal and a carrier signal having a design center frequency, comprising:

a fixed frequency oscillator for producing an oscillator signal at the design center frequency with a frequency offset existing between the oscillator signal and the carrier signal;

first mixing means for mixing the data modulated signal with the oscillator signal phase shifted by 90 degrees to produce a first product signal;

second mixing means for mixing the data modulated signal with the oscillator signal to produce a second product signal;

said first and second product signals being the quadrature components of the data signal and the frequency offset existing between the oscillator signal and the data modulated signal;

processing means responsive to the first and second product signals for producing a complex number signal; and

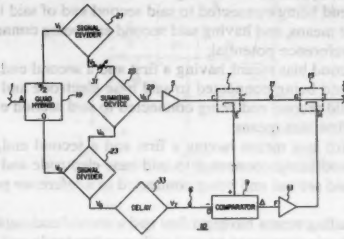
said processing means operative to combine the first and second product signals and the complex number signal for removing the frequency offset to produce the data signal.

4,348,642

FEEDFORWARD WIDEBAND AMPLIFIER

Timothy A. Harrington, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 29, 1980, Ser. No. 182,533
Int. Cl.³ H03F *1/26*
U.S. Cl. 330—149 **6 Claims**



1. A feedforward wideband power amplifier for amplifying an electromagnetic wave signal, comprising:

first signal path including in cascade arrangement, signal amplifier means for amplifying the electromagnetic wave signal and a first delay network;

a second signal path including in cascade arrangement, a second delay network, summing device and an error amplifier;

a phase intercept distortion compensation means for dividing the electromagnetic wave signal into two signals in phase quadrature with each other to obtain a first signal and a second signal, for matching the phase and amplitude of the first signal to the second signal and for applying the first signal to the first signal path and the second signal to the second signal path;

a coupler means for coupling an amplified sample of the first signal to the one input terinal of the summing device; and

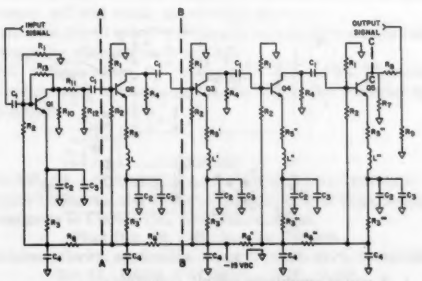
recombiner means for recombining the output signal of the first signal path with the output signal of the second signal path.

4,348,643

CONSTANT PHASE LIMITER

W. Richard Tennyson, Utica, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Nov. 5, 1980, Ser. No. 204,091
Int. Cl.³ H03F *3/191, 1/34*
U.S. Cl. 330—294 **5 Claims**



1. A constant phase limiter comprising:

(a) a plurality of substantially identical cascaded transistor stages, each of said stages including a transistor having a base, an emitter, and a collector electrode and having an input circuit between said base and said emitter electrode,

and an output circuit between said emitter and said collector electrode;

(b) an impedance means having a first end and a second end, said first end being connected to said emitter electrode;

(c) a first bias means having a first end and a second end, said first end being connected to said second end of said impedance means;

(d) a first bypass means having a first and a second end, said first end being connected to said second end of said impedance means, and having said second end being connected to a reference potential;

(e) a second bias means having a first and a second end, said first end being connected to said base electrode and having said second end being connected to said second end of said first bias means;

(f) a third bias means having a first and a second end, said first end being connected to said base electrode and having said second end being connected to a reference potential;

(g) a loading means having a first and a second end, said first end being connected to said collector electrode and having said second end being connected to a reference potential;

(h) a coupling capacitor means having a first and a second end, said first end being connected to said collector electrode and having said second end being a first terminal of the output circuit;

(i) a decoupling means having a first and a second end, said first end being connected to said second end of said first bias means and having said second end being connected to a second terminal of the output circuit;

(j) a bypass and decoupling means having a first and a second end, said first end being connected to said second end of said first bias means and having said second end being connected to a reference potential; and

(k) said impedance means further comprising a feedback resistor and a feedback inductor chosen so as to provide an overall constant phase limited output characteristic for a desired range of input signal levels.

4,348,644

POWER AMPLIFYING CIRCUIT WITH CHANGING MEANS FOR SUPPLY VOLTAGE

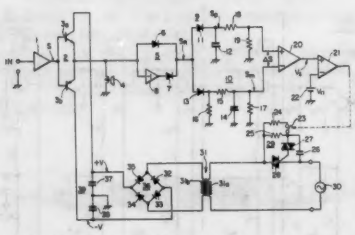
Shingo Kamiya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 24, 1980, Ser. No. 133,360

Claims priority, application Japan, Sep. 14, 1979, 54-118029; Sep. 14, 1979, 54-118030

Int. Cl.³ H03F *3/21, 3/26*

U.S. Cl. 330—297 **15 Claims**



1. A power amplifying circuit, comprising:

a power amplifying element for amplifying an input electrical signal thereto;

detecting means for detecting a crest factor of a waveshape of an input signal amplified by said power amplifying element, the crest factor being proportional to the difference between a peak value of the input signal and a mean value of the input signal and providing a crest factor signal indicative thereof; and

controlling means for controlling a supply voltage for the power amplifying element of said power amplifying circuit in response to the crest factor signal such that the supply voltage (a) elevates as the crest factor becomes larger and (b) lowers as the crest factor becomes smaller.

4,348,645

BUFFER AMPLIFIER CIRCUIT USED IN WIDEBAND TUNER

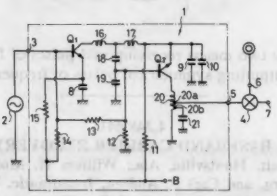
Susumu Ushida, and Hiroyuki Yanagida, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,672

Claims priority, application Japan, Aug. 28, 1979, 54-118238[U]

Int. Cl.³ H03F *3/191;* H04N *5/50*

U.S. Cl. 330—306 **1 Claim**



1. A buffer amplifier circuit adapted to receive the output from a local oscillator and to amplify and deliver said output signal to a mixer, said buffer amplifier comprising:

an input terminal for receiving said output signal from said local oscillator;

an amplification means for amplifying said output signal;

an output transistor for delivering a signal to said mixer, said output transistor having an output electrode grounded through a matching transformer having first and second taps;

a capacitor connected between said first tap and the ground, said capacitor constituting in combination with said matching transformer a trap circuit adapted to have resonance oscillation at a frequency of an order twice as high as the low region oscillation frequency of said local oscillator; and

an output terminal connected to said second tap and adapted to deliver the amplified local oscillation signal to said mixer.

4,348,646

TIME-DELAY-TRIGGERED TRAPATT OSCILLATOR WITH DIRECTIONAL FILTER

Barrie H. Newton, Copthorne; Peter L. Booth, Reigate, and Robert Davies, Copthorne, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1980, Ser. No. 151,218

Claims priority, application United Kingdom, May 23, 1979, 7917969

Int. Cl.³ H03B *9/14*

U.S. Cl. 331—77 **2 Claims**

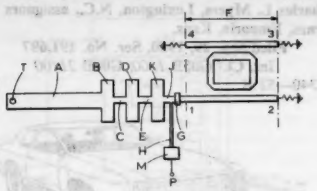
1. A time-delay-triggered TRAPATT oscillator circuit for operating at a predetermined frequency, comprising:

a delay line;

a TRAPATT diode connected to one end of the delay line;

a matching filter having one end connected to the delay line at a predetermined distance from the diode, said filter comprising successive sections of transmission line of different impedances;

a directional filter connected to an end of the matching filter remote from the delay line; and



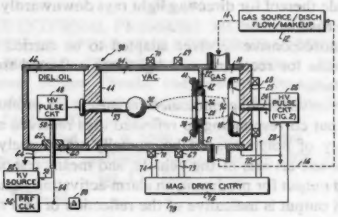
means for extracting energy from the directional filter at the predetermined frequency.

4,348,647

STABILITY ENHANCED RARE-GAS MONOFLUORIDE LASERS

William L. Nighan, and Robert T. Brown, both of Manchester, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 5, 1980, Ser. No. 156,547
Int. Cl.³ H01S *3/22, 3/97*
U.S. Cl. 372—74 **1 Claim**



1. An improved rare-gas monofluoride pulse laser, pumped by an electron beam sustained electric discharge, including:

a laser chamber containing a mixture of a rare-gas buffer gas, a rare-gas energy transfer gas, and a fluorine fuel gas, and providing a laser gain region;

electron beam sustained electric discharge means including a high voltage source connected between an anode and a cathode disposed to provide an electric field in said laser gain region and a pulsed electron gun for injecting high energy primary electrons into said laser gain region;

wherein the improvement for delaying the onset of instability of the electric discharge comprises a fractional concentration, on the order of one-tenth of the fractional concentration of fluorine fuel gas, of nitrogen trifluoride in said mixture, whereby said laser chamber contains both said fluorine fuel gas and said nitrogen trifluoride.

4,348,648

TRANSIENT SUPPRESSION CIRCUIT

Richard B. Childs, White Plains, N.Y., assignor to Optical Information Systems, Inc., Elmsford, N.Y.

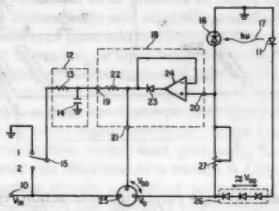
Filed Jul. 25, 1979, Ser. No. 60,722
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—29 **8 Claims**

1. Transient suppression circuit for substantially eliminating transients or overshoot during turn-on/turn-off of a light emitting diode comprising:

(a) a voltage input means for providing a bias to the light emitting diode, the voltage input means including a time delayed portion which provides a first voltage whose magnitude increases with time;

(b) detecting means for detecting electromagnetic radiation emitted by the light emitting diode, said detecting means generating a second voltage in response to the detected radiation of the light emitting diode;

(c) diode circuit means including at least one diode coupled between an output of said delay portion and an output of said detecting means to receive said first and second voltages and functioning to clamp an output of said diode circuit at a voltage substantially equal to the higher of said first and second voltages; and



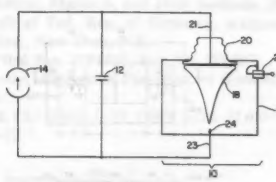
(d) voltage regulator means for regulating voltage to the light emitting diode and responsive to the voltage output of the diode circuit.

4,348,649

MICROWAVE POWER PULSE GENERATOR

Dieter R. Lohrmann, Lanham, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 8, 1980, Ser. No. 176,319
Int. Cl.³ H03K *3/05*
U.S. Cl. 331—96 **8 Claims**



1. A self-pulsing microwave generator comprising:

a means for emitting electrons at a threshold potential;

a resonator means for producing oscillations at an rf frequency comprising a quarter-wavelength resonator shaped to minimize the interelectrode capacitance between said resonator means and said means for emitting electrons;

an electron transit space between said resonator means and said means for emitting electrons; and

a DC voltage means for producing a time variant potential between said resonator means and said means for emitting electrons.

4,348,650

SURFACE-ACOUSTIC-WAVE PARAMETRIC DEVICE

Shoichi Minagawa, and Takeshi Okamoto, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

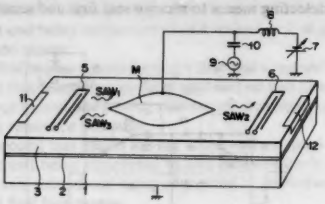
Filed Dec. 29, 1980, Ser. No. 220,678
Claims priority, application Japan, Dec. 27, 1979, 54-169299
Int. Cl.³ H03H *9/64;* H01L *27/20, 19/00*
U.S. Cl. 333—195 **10 Claims**

1. A surface-acoustic-wave parametric device which comprises:

a laminate formed of a semiconductor layer and a piezoelectric layer;

means for applying a pumping voltage to said laminate;

means for inputting surface acoustic wave to said laminate; and means for outputting surface acoustic wave subjected to a parametric interaction;



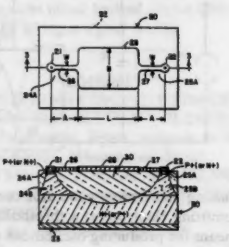
said laminate having a parametric interaction region having a width perpendicular to a propagation direction of surface acoustic wave which varies, in the propagation direction of the surface acoustic wave, corresponding to a desired frequency characteristic of the output surface acoustic wave.

4,348,651

CASCADING DIODE SWITCHES

Martin J. Reid, Chelmsford, Mass., assignor to Alpha Industries, Inc., Woburn, Mass.

Filed Jan. 30, 1981, Ser. No. 229,975
Int. Cl.³ H01P *1/15, 11/00, 3/08;* H01L *21/98*
U.S. Cl. 333—262 **10 Claims**



1. Microwave switching apparatus comprising,

a semiconductor substrate formed with at least first and second diodes between top and bottom surfaces,

first and second conducting portions on opposed surfaces of said substrate,

said first conducting portion interconnecting regions of like conductivity type of said first and second diodes and having like end portions of end width and length interconnected by an intermediate portion of intermediate width and length,

said end width being less than said intermediate width,

said end length being sufficiently less than a quarter wavelength of microwave energy to be selectively transmitted so that each end portion presents an inductive reactance between a respective one of said diode portions and said intermediate portion,

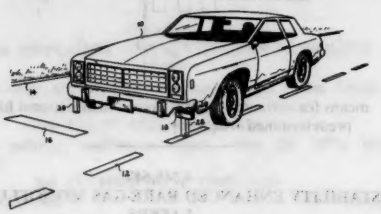
said intermediate portion coacting with said second conducting portion to form a transmission line having a characteristic impedance less than that of the transmission line portion formed by each end portion with said second conducting portion.

4,348,652

DRIVER ALERT SYSTEM

Robert R. Barnes, 1542 SW. Glick Rd., Topeka, Kans. 66604, and Charles L. Myers, Lexington, N.C., assignors to Robert R. Barnes, Emporia, Kans.

Filed Sep. 29, 1980, Ser. No. 191,697
Int. Cl.³ G05B *1/00;* G08B *21/00*
U.S. Cl. 340—52 R **15 Claims**



1. Apparatus for warning the driver of a motor vehicle when the vehicle is about to drift across a line on a road surface having a width within a predetermined range of minimum and maximum widths indicative of a center line or an edge line, said apparatus comprising:

a light source adapted to be carried by said vehicle adjacent a side thereof for directing light rays downwardly toward the road surface,

a photoresponsive receiver adapted to be carried by said vehicle for receiving said light rays reflected from said surface,

said receiver having photoelectric means for producing an output corresponding to reflected rays received at a plurality of points spaced horizontally transversely of the fore-and-aft axis of the vehicle, and means responsive to said output for producing an alarm-activating signal when said output is indicative of the reflection of said received rays from a line on said surface of at least said minimum width but no greater than said maximum width, and

alarm means responsive to said activating signal for warning the driver, whereby to alert the driver to the detection of a center or edge line and discriminate against other markings of greater or lesser width.

4,348,653

METHOD AND SYSTEM FOR INDICATING AUTOMOBILE ABNORMAL CONDITIONS

Yoshihiko Tsuzuki, Anjo; Hiroshi Okazaki, Okazaki; Shinji Shirasaki, Kariya; Masahiro Matsuyama, Kariya; Masanobu Kobayashi, Kariya, and Yoji Ito, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 17, 1981, Ser. No. 244,776
Claims priority, application Japan, Mar. 21, 1980, 55-36613
Int. Cl.³ B60Q *5/00*
U.S. Cl. 340—52 F **16 Claims**

1. A method of indicating an abnormal condition of an automobile, comprising the steps of:

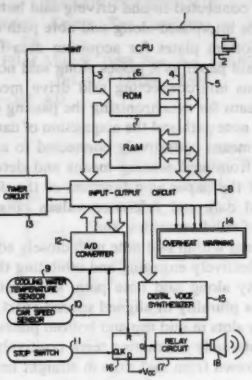
monitoring inspection items relating to the driving of the automobile;

deciding that the condition of an inspection item has reached a first abnormal condition;

automatically generating a voice cautioning the driver of the abnormal condition of said inspection item when a parameter for determining the generation of a cautioning voice has reached a predetermined level of generation of the cautioning voice after the time point of said decision of the first abnormal level;

deciding that the condition of said inspection item has reached a second abnormal level higher than said first abnormal level;

and automatically generating a voice warning the driver of an abnormal condition of said inspection item regardless of the



driving condition of said car at the time of said decision on the reaching of said second abnormal level.

4,348,654

TIRE INTERNAL PRESSURE MONITORING AND DISPLAY APPARATUS FOR TIRED VEHICLES

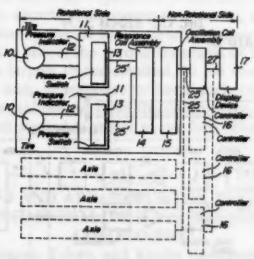
Akira Matsuda, Higashimurayama; Yoshihiro Hayakawa, Akigawa; Shigeo Yasuda, and Motoaki Iwasaki, both of Musashino, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 9, 1980, Ser. No. 214,898

Claims priority, application Japan, Dec. 29, 1979, 54/170654

Int. Cl.³ B60C *23/02*

U.S. Cl. 340—58 **5 Claims**



1. A tire internal pressure monitoring apparatus for tired vehicles, comprising: a rubber hose connected to a valve provided on a tire for vehicles, a pressure indicator secured to that position of a rotational body of the vehicle which is near the center of the rotational shaft of said rotational body and operative to indicate the internal pressure of the tire supplied from the tire through said rubber hose, a pressure switch incorporated into said pressure indicator and operative to transduce a decrease in the internal pressure of the tire to a value lower than a given value into an electrical signal, a resonance coil assembly electrically connected to said pressure switch and secured to a given position on the periphery of said rotational body so as to transmit a signal for detecting a decrease of the internal pressure of the tire to a stationary body side of the vehicle, an oscillation coil assembly secured to that position of the vehicle body side which is near said rotational body and operative to normally generate a high frequency signal, said resonance coil assembly being brought into a position opposed to and near said oscillation coil assembly everytime said rotational body is rotated by one turn to generate a signal sensitive to the internal pressure of the tire in response to the presence or absence of the resonance of said resonance coil assembly, a controller connected to said oscillation coil assembly and operative to treat said signal delivered from said oscillation coil assembly and a signal representing presence or absence of the run of the vehicle so as to generate an alarm signal, and a display device connected to said controller and displaying said alarm signal delivered from said controller to a driver, wherein said controller comprises an input signal treatment circuit for treating said signal delivered from said oscillation coil assembly, a run discrimination switch operative to become ON at a speed lower than a given speed and prohibit generation of said alarm, a contact point signal treatment circuit connected to said run discrimination switch and generating an electrical signal when said run discrimination switch is ON or OFF, a run discrimination circuit connected to said contact point signal treatment circuit and operative to discriminate the vehicle's run and treat the signal delivered from said input signal treatment circuit, a signal hold circuit including a gate and operative to be rendered conductive when said gate receives the signal delivered from said run discrimination circuit and hold the current flowing main current path thereof, an alarm display circuit connected to said main current path of said signal hold circuit, a reset switch connected to said alarm display circuit and resetting said signal hold circuit, a failure check switch connected to said contact point signal treatment circuit and operative to check the failure induced in the apparatus when the vehicle is stopped, and an electric source operative to supply current.

4,348,655

CONTROL CIRCUIT FOR VEHICLE TURN-SIGNAL FLASHER SYSTEMS

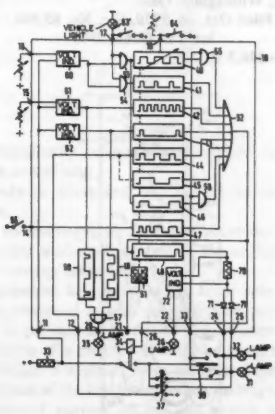
Horst Goertler, Sachsenheim; Friedrich Hetzel, Muhlacker; Hans Prohaska; Horst Rachner, both of Bietigheim-Bissingen; Wolf Seitter, Marbach, and Josef Swoboda, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,087

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944526

Int. Cl.³ B60Q *1/38*; G08B *5/38, 21/00*

U.S. Cl. 340—73 **4 Claims**



1. A control circuit for the turn-signal flasher system of an automotive vehicle and being of the type in which a source of operating current is selectively applied to one of two turn-signal lamps by way of a serially coupled direction indicator switch and in which the current is periodically interrupted by

a switching element serially coupled between said source and said lamps, said control circuit comprising:

a measuring resistor serially coupled between said source and said lamps;

a first pulse generator having an input and output wherein said output is coupled to said switching element for interrupting said current;

a second pulse generator having an output coupled to said switching element for interrupting said current and having an input for activating said second pulse generator;

a voltage indicator coupled to said resistor and to said inputs of said first and second pulse generators for activating one of said first and second pulse generators when the voltage drop across said resistor is within a predetermined voltage range corresponding to normal current levels;

gating means coupled between said voltage indicator and the inputs of the pulse generators for selecting one of said first and second pulse generators in response to an external input signal;

a third pulse generator having an output coupled to said switching element for interrupting said current and having an input for activating said third pulse generator;

a second voltage indicator coupled to said measuring resistor and to said input of said third pulse generator for activating said third pulse generator when the voltage drop across said resistor is within a predetermined voltage range corresponding to current levels which are less than said normal current levels;

a fourth pulse generator having an output coupled to said switching element for interrupting said current and having an input for actuating said fourth pulse generator; and,

a third voltage indicator coupled to said measuring resistor and to said input of said fourth pulse generator for activating

said fourth pulse generator when the voltage drop across said resistor is within a predetermined voltage range corresponding to current levels which are greater than said normal current levels.

4,348,656

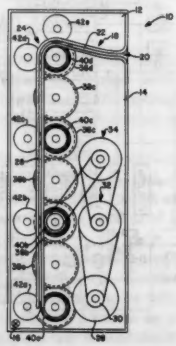
SECURITY VALIDATOR

Robert L. Gorgone, Mentor; Gerald M. Iannadrea, Painesville; Anthony H. Dolejs, Bedford Heights; Bruce R. Knox, Wickliffe, and Alan J. Kovach, Cleveland, all of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

Filed Oct. 16, 1979, Ser. No. 85,394

Int. Cl.³ G06K *9/00*

U.S. Cl. 340—146.3 R **33 Claims**



1. A note acceptor for receiving and determining the authenticity of a paper security such as a currency, bank notes, and the like, comprising:

top and bottom plates defining a note path therebetween for receiving a paper offered as a valid security;

paired top and bottom rollers respectively received by said top and bottom plates in contacting engagement within said note path;

drive means connected to and driving said bottom rollers;

sensing means interposed along said note path between said top and bottom plates for acquiring data from specific areas on said paper as it passes along said note path;

control means interconnecting said drive means and said sensing means for synchronizing the passing of said paper along said note path and the acquisition of data therefrom;

comparison means operatively connected to and receiving said data from said sensing means and determining the validity of the paper as a function of the difference between said data and reference values obtained from a plurality of valid securities; and

first gate means within said note path closely adjacent a first end for selectively engaging and inhibiting the passage of the security along said note path, said first gate means including a plurality of aligned spaced-apart, positionally alternating slots in said top and bottom plates and spaced-apart, positionally alternating teeth positively driven into and withdrawn from said slots in straight line action.

4,348,657

METHOD FOR TRANSMITTING BINARY SIGNALS OVER A FOREIGN WIRING NETWORK

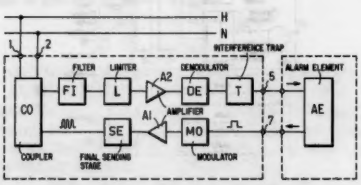
Willi Merkel, Albstadt, Fed. Rep. of Germany, assignor to Fritz Fuss Kom. Ges. Elektrotechnische Fabrik, Albstadt, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,878

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923716

Int. Cl.³ H04B *3/54*

U.S. Cl. 340—310 R **6 Claims**



1. A method for transmitting binary signals having two logical states over a foreign wiring network, in particular for transmitting signals between the structural elements of an alarm installation over the electrical supply wiring network, wherein at least one of the two logical states of the binary signals is converted into a particular frequency, provided to the foreign network, and selected on a receiving end by filtering devices, said method comprising the steps of:

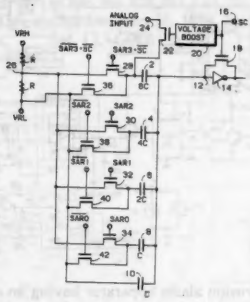
recovering the binary signals on the receiving end; and

passing the recovered binary signals through a first and a second differentiating network having resistors bridged, in each network, by a diode, said diode in said first differentiating network being connected in a direction opposite to that of the diode in the second differentiating network, said first and second differentiating networks operating as an interference trap to identify and block interference pulses.

4,348,658
ANALOG-TO-DIGITAL CONVERTER USING HALF RANGE TECHNIQUE

Ernest A. Carter, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1980, Ser. No. 148,097
Int. Cl.³ H03K *13/08*
U.S. Cl. 340—347 AD **7 Claims**



1. A successive-approximation charge-redistribution analog-to-digital converter comprising:

comparator means for producing an output in response to an input thereto exceeding a predetermined threshold voltage;

a plurality of binary weighted capacitors, each having a first terminal coupled in common to the input of the comparator means, and a second terminal;

voltage reference means for producing first and second predetermined reference voltages;

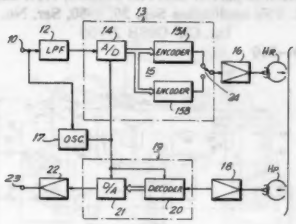
sample means for sampling, during a sample phase, an unknown analog input voltage onto the largest of the capacitors, and for simultaneously coupling the second terminals of each of the other capacitors to the first reference voltage while shorting the comparator means; and successive approximation means for successively coupling, during a conversion phase, the second terminals of the capacitors, from the largest to the smallest, to the second reference voltage, and, in response to each such coupling which produces said output from the comparator means, recoupling such second terminal to the first reference voltage.

4,348,659
METHOD AND APPARATUS FOR ENCODING A DIGITAL SIGNAL TO HAVE MINIMAL DC COMPONENT

Yasuhiro Fujimori, Tokyo, and Kaichi Yamamoto, Zama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1980, Ser. No. 199,598
Claims priority, application Japan, Oct. 29, 1979, 54-139662
Int. Cl.³ H03K *13/00, 13/24*
U.S. Cl. 340—347 AD **29 Claims**

16. Apparatus for converting an analog signal to an m-bit digital signal having minimal DC component, comprising quantizing means for quantizing said analog signal over a range of l quantizing levels; storage means having plural addressable storage locations, a respective storage location being addressed in response to the particular quantized level of said analog signal, for storing l m-bit digital signals representing said l quantizing levels, respectively; each m-bit digital signal having an intrinsic run-length of "1" and "0", and those m-bit digital signals having zero disparity representing a predetermined band of said l quantizing levels, with said zero-disparity signals having the smallest run-lengths stored at those locations which are addressed in response to those quantized levels disposed substantially in the center of said range of l quantizing levels and those zero-disparity signals having progressively larger run-lengths stored at those locations which are addressed in response to those quantized levels disposed progressively farther from said center; and address means for addressing a

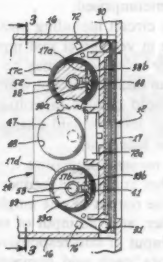


storage location of said storage means as a function of the quantized analog signal to read out the m-bit digital signal stored at said addressed location.

4,348,660
AUTOMATICALLY RELEGENDABLE KEYBOARD

Anthony L. Robertsen, Mission Viejo, and Andrew M. McInnis, Los Alamitos, both of Calif., assignors to Sheldon Industries Inc., Monrovia, Calif.

Filed Sep. 9, 1980, Ser. No. 185,542
Int. Cl.³ G06C *7/02*
U.S. Cl. 340—365 VL **21 Claims**



1. In automatically relegendable keyboard apparatus, the combination comprising

(a) an endwise elongated belt having keyboard legends thereon,

(b) drive means engaging the belt to drive the belt endwise and present a selected portion of the keyboard belt in a planar viewing zone, and

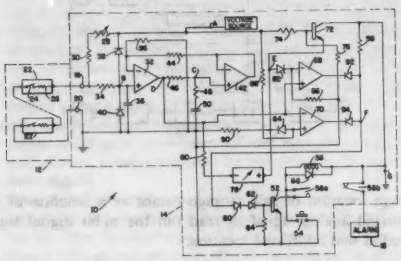
(c) a transparent key panel at the front side of said belt portion presented at said viewing zone, with associated means to provide an electrical output corresponding to the location of a selected area of the panel to which the user's finger is applied, there being multiple of said selected areas of the key panel corresponding to legends on said selected portion of the belt which are viewable through the transparent key panel,

(d) the key panel overlying the belt, and there being a rigid protective transparent panel sandwiched between said selected portion of the belt and said key panel so that the rigid panel and the key panel both overlie the belt, the rigid panel blocking motion transmission from the key panel to the belt.

4,348,661
SELF-BALANCING ALARM SYSTEM

Armand P. Lucchesi, Jersey City, N.J., assignor to J. C. Penney Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 963,133, Nov. 22, 1978, abandoned. This application Sep. 26, 1980, Ser. No. 190,991
Int. Cl.³ G08B 29/00
U.S. Cl. 340—510 2 Claims

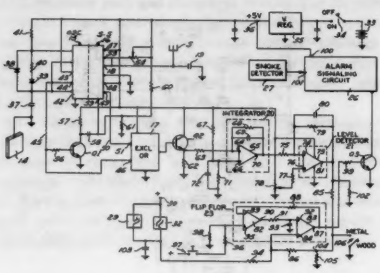


1. A detection circuit for use in an alarm system comprising:
a security loop having a plurality of sensing means adapted to be located at respective entries into a zone under protection;
voltage producing means;
alarm means;
a responsive circuit adapted to respond to a change in condition of said security loop to enable said alarm means from a disabled condition;
said security loop connected between said voltage producing means and ground to provide a predetermined voltage level at an input to said responsive circuit when said security loop is uncomprised;
said responsive circuit including means for linearly balancing a change in voltage at said input from said predetermined voltage level which may be bi-directional to maintain said alarm disabled except when said change equals at least a threshold change in voltage from said predetermined voltage level or said change occurs more rapidly than it can be balanced;
said balancing means comprising a pair of amplifiers connected together in negative feedback fashion, delay means connecting the output of one amplifier to an input of the other amplifier, and the input of said one amplifier comprising said input of said responsive circuit;
two comparators, each said comparator having a pair of input terminals, means providing a reference voltage at one input terminal of each comparator, the other input terminal of each comparator being connected to said output of said one amplifier, said reference voltage at said one input terminal of each comparator differing from the voltage level at said other input terminals by a substantially equal positive and negative value;
said reference voltage providing means comprising two independent sources of a constant voltage potential, voltage divider means connected to each independent source, and each said one input terminal connected to a respective one of said voltage divider means;
one independent source of a constant voltage potential comprising a regulated source of D.C. potential, and said voltage producing means including said regulated source; and
said other independent source of a constant voltage potential comprising an unregulated source of D.C. potential, a transistor, the base of said transistor connected to and controlled by said regulated source, while the collector being connected to said unregulated source, and said other independent source of voltage potential being derived at the emitter of said transistor.

4,348,662
CAPACITY SENSING INTRUSION ALARM APPARATUS

William G. Fontaine, Pompano Beach, and Willes W. Reeder, Fort Lauderdale, both of Fla., assignors to Sleep Safe, Limited, Pompano Beach, Fla.

Filed Nov. 24, 1980, Ser. No. 210,056
Int. Cl.³ G08B 13/26, 17/10, 19/00
U.S. Cl. 340—562 19 Claims

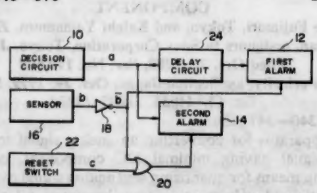


1. In an intrusion alarm apparatus having an oscillator producing a first series of output pulses at a predetermined frequency, the improvement which comprises:
means for producing a second series of output pulses synchronized with the output pulses of said first series and of shorter duration than the latter;
means responsive to said first and second series of output pulses for producing a control signal representing the difference in duration between the pulses of said first and second series;
a sensor operatively arranged to change the duration of the pulses of said second series and thereby change said control signal in response to the body capacitance of a person touching said sensor;
and an alarm signalling circuit operable by said control signal to signal an alarm when a person touches said sensor.

4,348,663
SAFETY ASSURANCE SYSTEM FOR ROAD VEHICLES

Takayuki Yanagishima, Yokosuka, and Yasutoshi Seko, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Aug. 26, 1980, Ser. No. 181,654
Claims priority, application Japan, Aug. 29, 1979, 54-109199
Int. Cl.³ G08B 21/00
U.S. Cl. 340—576 11 Claims



1. A system for use in a road vehicle, comprising:
(a) means for providing a warning signal;
(b) means for providing a rest signal when said road vehicle is at rest;
(c) means for providing a reset signal;
(d) first alarm means responsive to the warning signal for making an alarm until receiving the rest signal;
and
(e) second alarm means responsive to the warning signal for

making an alarm until receiving the rest signal or reset signal.

4,348,664

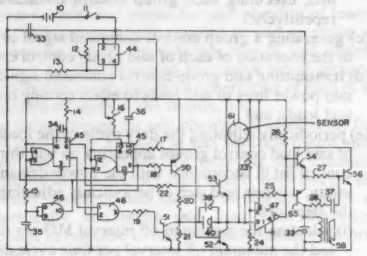
DEVICE FOR MEASURING ULTRAVIOLET LIGHT EXPOSURE

Armando Boschetti, Bryan, Ohio, and David J. Snoek, Grand Rapids, Mich., assignors to Elder Pharmaceuticals, Inc., Hamilton, Ind.

Continuation-in-part of Ser. No. 956,202, Oct. 30, 1978, Pat. No. 4,279,254. This application Nov. 26, 1979, Ser. No. 97,500

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—600 10 Claims



1. An apparatus for rendering safer the application of ultraviolet light radiation to the skin of a subject, comprising means for precisely monitoring the total ultraviolet light radiation energy per unit area impinging upon the subject, and providing notification when a predetermined amount of energy per unit area has been applied to the subject, said apparatus comprising:

(a) photoelectric means for providing an electrical signal proportional to the intensity of the ultraviolet light which impinges thereon,

(b) rechargeable electrochemical means for integrating the signal from said photoelectric means, and means for recharging said electrochemical means to a state of charge corresponding to the total amount of ultraviolet light radiation that is desired to be applied per unit area upon the subject, and

(c) means for providing notification when the total light energy received by the subject reaches predetermined value as determined by the discharged state of said electrochemical means.

4,348,665

METHOD AND APPARATUS FOR MONITORING BEARING WEAR

Heinz A. Rode, Solon; Meter Fromel, Austintown, and Perry L. Beaver, Vienna, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 6, 1980, Ser. No. 127,580

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—682 5 Claims

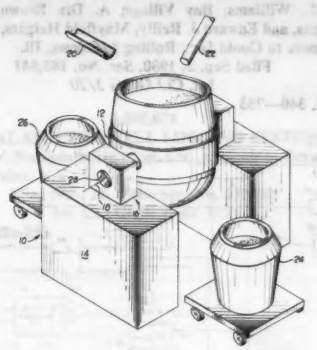
1. A system for monitoring wear of a trunnion bearing supporting a basic oxygen furnace vessel, said bearing including a housing and bearing structure for receiving a shaft, said system comprising:

(a) a first transducer for producing a first output representing the distance between an idler side of said shaft and said first transducer;

(b) a second transducer for producing an output representing the distance between the drive side of said shaft and said second transducer;

(c) circuitry for monitoring said first and second transducer outputs and producing an alarm signal when the distance between the shaft and either transducer exceeds a predetermined value, and

(d) a detector for indicating rotational orientation of the shaft with respect to a reference orientation; and



(e) a data generator coupled to said circuitry for producing an indication of both the idler side and drive side shaft-to-transducer distances and of the angular orientation of said shaft.

4,348,666

SIGNAL LEVEL DISPLAY APPARATUS

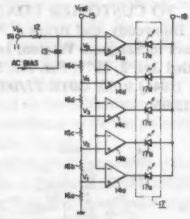
Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 19, 1980, Ser. No. 160,844

Claims priority, application Japan, Jun. 20, 1979, 54-84331[U]; Jul. 18, 1979, 54-91306

Int. Cl.³ G09G *3/32*

U.S. Cl. 340—753 19 Claims



1. In a signal level display apparatus comprising:

a plurality of comparators having two input terminals respectively for receiving at one of the two input terminals mutually different reference voltages respectively, and at the other input terminals a same input signal; and a plurality of light-emitting elements driven separately by outputs of said comparators and forming a display unit,

the improvement comprising:

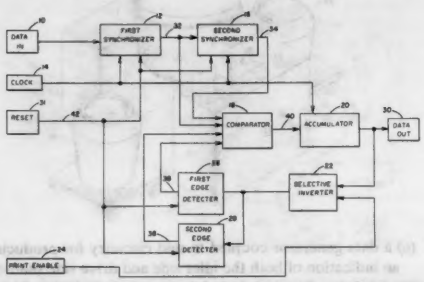
means for varying, with time and repetitively, the relative magnitudes of one of said input signal and said reference voltages so as to cause differences in brightness of illumination between said light-emitting elements.

4,348,667

AUTOMATIC LINE SEGMENT GENERATOR FOR USE WITH LINEAR ARRAY DISPLAY DEVICES

Glenn L. Williams, Bay Village; A. Dix Brown, Cleveland Heights, and Edward J. Reilly, Mayfield Heights, all of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 3, 1980, Ser. No. 183,841
Int. Cl.[3] G09G 3/20
U.S. Cl. 340—753 9 Claims



1. An apparatus for automatically generating line segments for use with linear array display devices, said apparatus comprising:

clock means;

synchronizing means operatively connected to said clock means for receiving and synchronizing incoming digital data to said clock means;

comparing means operatively connected to said synchronizing means to compare the output of said synchronizing means to another signal and produce line segment data;

accumulator means operatively connected to said comparing means to accumulate said line segment data; and

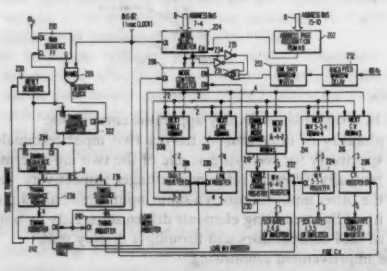
edge detecting means to detect changes in digital states of said accumulator means, the output of said edge detecting means being said another signal to said comparing means, said comparing means automatically generating line segment data beginning when data is first synchronized or first detected and ending when data is last synchronized or detected.

4,348,668

SYSTEM FOR CONTROLLING POWER DISTRIBUTION TO CUSTOMER LOADS

George P. Gurr, Dunwoody, and Bruce J. Nelson, Lilburn, both of Ga., assignors to Sangamo Weston, Inc., Atlanta, Ga.

Filed Jul. 2, 1979, Ser. No. 53,710
Int. Cl.[3] H04Q 9/00; G01R 21/00; H02J 4/00
U.S. Cl. 340—825.06 5 Claims



1. A method for regulating a plurality of loads connected by power lines of an electric power utility to a remote utility station, said utility station having an electronic digital computer for controlling communications to the loads, said loads being classified into load control groups, each of said groups being responsive to at least one of a plurality of group control command signals for causing the loads in the respective group to be turned on or off, which comprises the steps of:

(a) storing in the computer at the station preselected first, second and third types of control lists, each of said lists including at least one group control command;

(b) selecting one of said control lists for activation and then executing the respective group control commands in the selected list as follows:

(i) upon selecting said first type of control list, executing each group control command therein only once;

(ii) upon selecting said second or said third type of control lists, executing each group control command therein repetitively;

(c) generating a group control command signal in response to the execution of each of said group control commands;

(d) transmitting said group control command signal through said power lines to said loads to effect turning on or off of said loads; and

(e) periodically adjusting the duty cycle of the loads in those of said load control groups appearing on said third type of control list in accordance with the power demand on said utility, wherein said step of periodically adjusting includes the steps of:

(i) selecting the maximum off interval MO per time cycle and the minimum off interval per time cycle desired for loads in each of said groups classified in said third type of control list;

(ii) monitoring the total power demand X on said utility;

(iii) selecting a minimum value AV and a maximum value MV for the total power demand which correspond respectively to said minimum and maximum off intervals; and

(iv) adjusting the actual off interval Y of said loads according to the following formula:

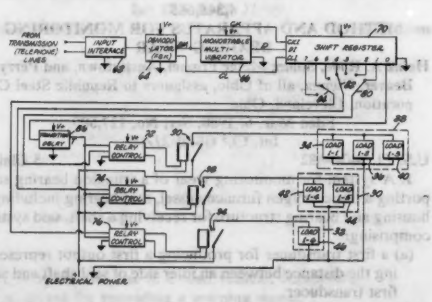
$$Y=(MO)((X-AV)/(MV-AV).$$

4,348,669

LOAD ENERGIZING AND DE-ENERGIZING CONTROL SYSTEM AND METHOD

Dudley E. Braun, 1700 Lyngrove Dr., Manhattan Beach, Calif. 90266

Filed May 5, 1980, Ser. No. 146,886
Int. Cl.[3] H04Q 9/00
U.S. Cl. 340—825.58 18 Claims



1. A system for controlling the energizing and de-energizing of energy-utilizing loads at facilities remote from each other, comprising:

(a) a transmitter, remote from each of the facilities, for generating and transmitting successive signal groups carrying a plurality of channels of information for controlling the

energizing and de-energizing of a plurality of loads at each of the facilities, each of said signal groups carrying said plurality of channels of information;

(b) a communication and control terminal at each of the remote facilities adapted for controlling the energizing and de-energizing of said plurality of loads at the facility in response to each of said same successive signal groups as the other of the facilities, including,

(1) receiving and generating means for receiving each of said transmitted successive signal groups and for generating successive signal groups, carrying said plurality of channels of information, representative of said transmitted successive signal groups, each of said generated signal groups carrying said plurality of channels of information;

(2) channel-selection means for said plurality of loads at the facility, operatively coupled to said receiving and generating means, for selecting one of said channels carried by said generated successive signal groups to control the energizing and de-energizing of each of said plurality of loads at the facility, and

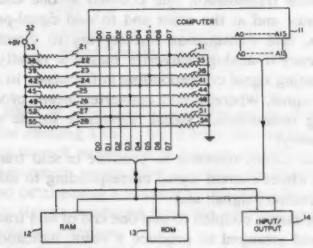
(3) switching means for said plurality of loads at the facility, operatively coupled to said selection means and to said plurality of loads, for receiving said channel of information selected for each of said loads and for electrically coupling said load to an energy source and electrically decoupling said load from the energy source, in response to said selected channel of information.

4,348,670

COMPUTER ACQUISITION OF DATA FROM NONADDRESSABLE SWITCHES

Wallace E. DeShon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 29, 1980, Ser. No. 116,438
Int. Cl.³ H04Q *9/00*; G08C *9/00*
U.S. Cl. 340—825.78 **3 Claims**



1. In a computer system in which a computer is interfaced to at least one computer bus device through address bus lines and data bus lines and in which an address from said computer which is not decoded by said at least one computer bus device results in said data bus lines being in a high impedance mode, the improvement comprising:

at least one switch having first and second terminals;

means for electrically connecting the first terminal of said at least one switch to a first data bus line;

a pull-up resistor;

a positive voltage supply;

means for electrically connecting the second terminal of said at least one switch through said pull-up resistor to said positive voltage supply;

a pull-down resistor; and

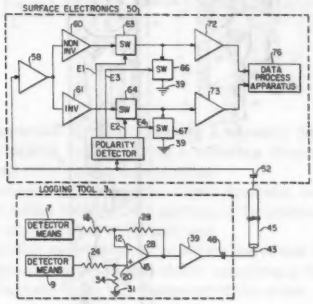
means for electrically connecting said first data bus line through said pull-down resistor to ground, the opening of said at least one switch resulting in a low logic level on said first data bus line when said first data bus line is in a high impedance mode, the closing of said at least one switch resulting in a high logic level on said first data bus line when said first data bus line is in a high impedance mode.

4,348,671

DUAL SPECTRA WELL LOGGING SYSTEM

Theodore W. Nussbaum, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 28, 1980, Ser. No. 210,881
Int. Cl.³ G01V *1/40, 5/00*
U.S. Cl. 340—853 **7 Claims**



1. A dual spectra well logging system comprising

a well logging tool adapted to be passed through a bore hole in an earth formation including

at least two sensing means for sensing at least one condition of the earth formation and providing pulse signals corresponding to the sensed condition,

means connected to both sensing means for providing a combined pulse signal in which the pulses of the pulse signal from one sensing means has one polarity while the pulses of the pulse signal from the other sensing means has an opposite polarity, and

means for applying the combined pulse signal to cable means;

cable means connected to the applying means in the well logging tool for conducting the combined pulse signal from the well logging tool within the bore hole to the surface of the earth formation; and

surface apparatus includes

means connected to the cable means for providing control signals in accordance with the polarity of pulses in the combined pulse signal,

means for amplifying the combined pulse signal,

inverting means connected to the amplifying means for inverting the first combined pulse signal to provide an inverted combined pulse signal,

first switch means receiving the combined pulse signal means and to the control signal means for passing the pulses of the combined pulse signal derived from the pulses of one polarity in accordance with the control signals,

second switching means connected to the inverted combined pulse signal means and to the control signal means for passing the pulses of the inverted combined pulse signal derived from the pulses of the opposite polarity, and

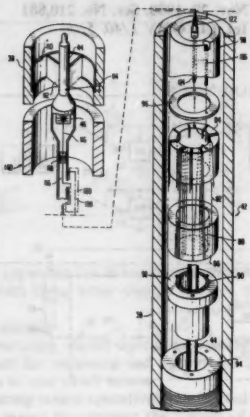
output means connected to both switching means for providing an output corresponding to the sensed condition of the earth formation in accordance with the pulses from both switching means.

4,348,672

INSULATED DRILL COLLAR GAP SUB ASSEMBLY FOR A TOROIDAL COUPLED TELEMETRY SYSTEM

Gregory C. Givler, Champaign, Ill., assignor to Tele-Drill, Inc., Richardson, Tex.

Filed Mar. 4, 1981, Ser. No. 240,264
Int. Cl.³ G01V 1/40
U.S. Cl. 340—854 9 Claims



1. An insulated drill collar and gap for a toroidal coupled telemetry system comprising:

a first annular sub member operable to be connected at one end to a drill collar and form a part of the drill collar, said first annular sub member having

a base portion at said one end thereof, and

an axial extension at the other end thereof, having a cross-sectional dimension less than the cross-sectional dimension of said base portion;

a second annular sub member operable to be connected at one end to a drill collar, and form a part of the drill collar, said second annular sub member having

a base portion at said one end thereof, and

an axially extending recess at the other end thereof, and having a cross-sectional dimension compatible with but greater than the cross-sectional dimension of said axial extension to form a peripheral gap between said axial extension and said axially extending recess;

dielectric material positioned within and occupying said gap between said axial extension and said axially extending recess to form an electrical isolation between said axial extension and said axially extending recess;

axial bearing means connecting said first annular sub member to said second annular sub member;

dielectric means positioned between said first and second annular sub members at said axial bearing means to electrically isolate said first and second annular sub members at said bearing location; and

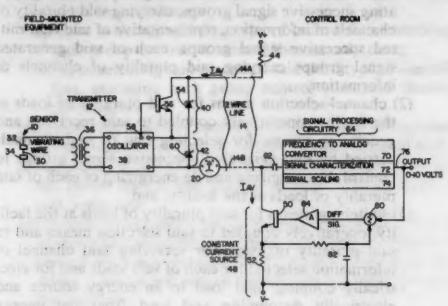
longitudinally extending means for preventing relative rotation between said first annular sub member and said second annular sub member wherein a connection between said first annular sub member and said second annular sub member is formed of structural integrity and concomitant electrical isolation.

4,348,673

INSTRUMENTATION SYSTEM WITH ELECTRIC SIGNAL TRANSMITTER

David A. Richardson, Sheldonville, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 951,520, Oct. 13, 1978, abandoned.
This application Dec. 18, 1980, Ser. No. 217,700
Int. Cl.³ G08C 19/12, 25/00
U.S. Cl. 340—870.18 36 Claims



1. In an instrument system of the type comprising a force sensor having a vibratable wire tensioned in accordance with the input force so that the resonant frequency of the wire is a measure of the applied force;

the combination of:

an oscillator coupled to said wire and operable therewith to develop an oscillator signal at the wire resonant frequency;

signal-processing means including frequency-to-analog converter means;

a two-wire transmission line coupled at one end to said oscillator and at the other end to said signal-processing means, said transmission line serving to direct to said frequency-to-analog converter means a rapidly-varying alternating signal corresponding in frequency to the oscillator signal, whereby said converter means produces an analog measurement signal responsive to the oscillator frequency;

d-c signal means operable to produce in said transmission line a direct-current signal corresponding to said analog measurement signal; and

indicator means coupled to said one end of said transmission line and arranged to produce a visual indication of the magnitude of said direct-current signal flowing in said transmission line.

4,348,674

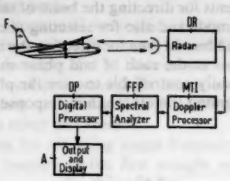
APPARATUS AND METHOD FOR CLASSIFYING MOVING TARGETS

Klaus Muth, Icking, and Philipp Federspieler, Hohenschaeftlarn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 165,296
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928907
Int. Cl.³ G01S 13/58
U.S. Cl. 343—5 SA 5 Claims

1. Apparatus for identifying targets comprising, a Doppler radar which transmits and receives radient energy to detect a

primary Doppler frequency line and a plurality of frequency spaced side Doppler frequency lines, and means for processing



and analyzing said primary and side Doppler lines to identify a target.

4,348,675

FM-CW RADAR SYSTEM FOR USE IN AN AUTOMOTIVE VEHICLE

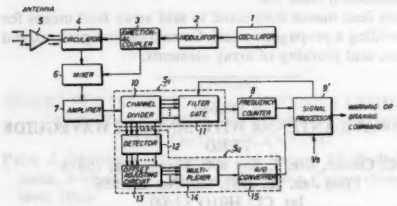
Takaya Senzaki, Iruma, and Eiji Murao, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1980, Ser. No. 171,149

Claims priority, application Japan, May 23, 1979, 55-69198; Jul. 24, 1979, 54/94104

Int. Cl.³ G01S *13/32*

U.S. Cl. 343—7 VM **3 Claims**



1. An FM-CW type radar system for use in an automotive vehicle for emitting a radio wave beam having the oscillating frequency thereof modulated at a given frequency, receiving reflected-to-return waves from an object or objects to be detected and determining a distance to the object by way of beat frequency signals produced from the emitting and receiving waves, which comprises:

means for dividing said beat frequency signals into a plurality of equal fractional frequency bands and detecting the thus-divided beat frequency signals;

signal processing means for operating arithmetically in a predetermined manner to provide an appropriate safe vehicle interval on each signal component of said divided frequency signals, whereby a warning or a command for actuating the brake of said vehicle is produced in accordance with said appropriate or safe vehicle interval distance;

signal extraction circuit means for selectively passing a beat frequency having a given frequency band width channel-by-channel in the beat frequency signal system thereof; and

channel selection circuit means for setting the frequency signal of each said channel at an appropriate reference level as a threshold value and offsetting each of said frequency signals set at said reference level, and thereafter optionally selecting the channel corresponding to the object to be detected in accordance with the output level of each said channel.

4,348,676

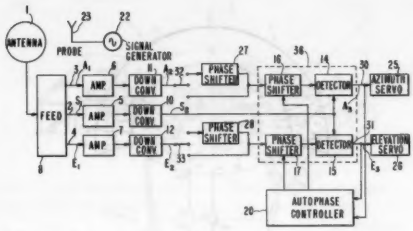
AUTOMATIC PHASE ALIGNMENT SYSTEM FOR A TRACKING ANTENNA

Nelson N. Tom, San Jose, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 9, 1980, Ser. No. 185,479

Int. Cl.³ G01S *5/02, 7/40, 13/00*

U.S. Cl. 343—114 **16 Claims**



1. An apparatus for phase aligning a steerable directional antenna's tracking system having a reference channel and a first tracking error channel, comprising:

a probe connected to a radiation signal generator, said probe placed within the near field aperture of the antenna but off of the antenna's boresight axis; and

a phase shifter switchably placed within one of said channels wherein adjustment of said shifter compensates for phase shifts introduced by the placement of the probe.

4,348,677

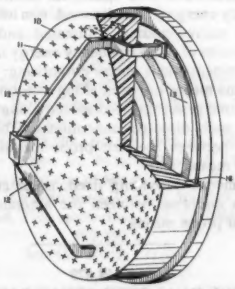
COMMON APERTURE DUAL MODE SEEKER ANTENNA

William E. Salmond, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jun. 25, 1979, Ser. No. 51,471

Int. Cl.³ H01Q *1/00*

U.S. Cl. 343—729 **7 Claims**



1. A common aperture seeker antenna comprised of:

a parabolic array of crossed dipoles being substantially reflective for radiated electrical signals in a band centered at a predetermined frequency f_0, and being substantially transmissive for radiated electrical signals outside of said band;

a monopulse waveguide feed fixedly positioned on the concave side of said parabolic array at the focal point thereof for operating at frequencies within said band; and

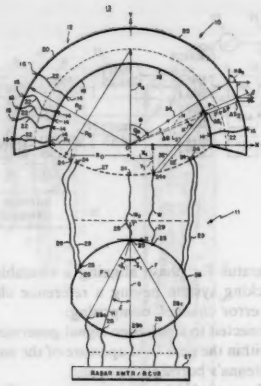
a planar spiral antenna fixedly positioned on the convex side of said parabolic array in axial alignment with said first antenna for operating at frequencies outside of said band.

4,348,678

ANTENNA WITH A CURVED LENS AND FEED PROBES SPACED ON A CURVED SURFACE

David T. Thomas, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 962,460, Nov. 20, 1978, abandoned.
This application Nov. 17, 1980, Ser. No. 207,832
Int. Cl.³ H01Q *3/26*
U.S. Cl. 343—754 **14 Claims**



1. A radio frequency antenna system for producing collimated beams of radio frequency energy in free space, comprising:

(a) curved array means for providing differently directed, noncollimated beams of radio frequency energy, each one disposed along a first nonlinear path, the direction of the noncollimated beams being produced in accordance with the distribution of the phase of the radio frequency energy across the first nonlinear path of the common aperture, each one of such noncollimated beams having a different phase distribution across the first nonlinear path of the common aperture; and

(b) radio frequency lens means, disposed between the curved array means and free space, for collimating the radio frequency energy in the directed, noncollimated beams to produce corresponding collimated and angularly redirected beams of radio frequency energy in free space, such radio frequency lens means comprising:

(i) antenna means disposed along a second nonlinear path;

(ii) a second probe means disposed along a third nonlinear path, such directed noncollimated beams being provided between the first probe means and the second probe means; and

(iii) means for providing fixed, predetermined electrical length coupling between the antenna means and the second probe means.

4,348,679

MULTI-MODE DUAL-FEED ARRAY RADAR ANTENNA

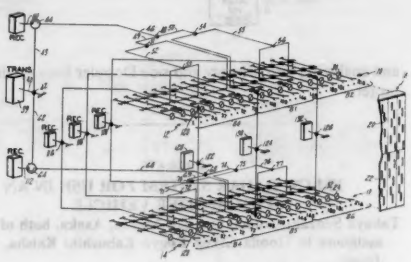
Harold Shnitkin, Roslyn, N.Y., and Peter W. Smith, Westport, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 6, 1980, Ser. No. 194,155
Int. Cl.³ H01Q *13/10, 3/30*
U.S. Cl. 343—768 **10 Claims**

1. An array antenna capable of sequentially operating in either a transmit mode and one of several receive mode, comprising:

means including a plurality of array elements disposed in a planar configuration, said array elements being positioned in at least one laterally extending row, adjacent ones of said array elements being separated by a distance corresponding to about one-half of the wavelength ($\lambda_0/2$), of said radar signals;

phase shifting means connected to each one of said plurality of array elements for directing the beam of said antenna in said transmit mode and also for selecting one of said several receive modes and then for directing the receive beam in such receive mode, each of said phase shifting means being individually controllable to vary the phase of radar signals propagating therethrough in response to a control



signal for collimating either of said transmit aperture or said receive aperture in a preselected direction;

an array feed means connected to each of said plurality of array elements through said phase shifting means, said feed means being in a ladder configuration and having a front feed and a rear feed which are interconnected by transmission lines; and

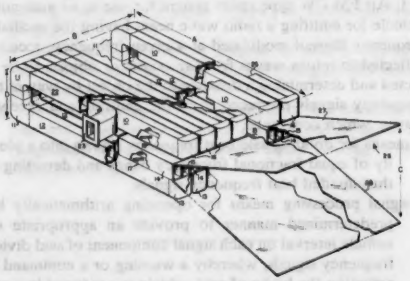
antenna feed means connected to said array feed means for providing a propagation path for said radar signals to, and from, said plurality of array elements.

4,348,680

MICROWAVE ANTENNA WITH SINUOUS WAVEGUIDE FEED

Donald C. Collier, Rte. 1, Box 80C, Plano, Tex. 75074

Filed Jan. 26, 1981, Ser. No. 228,558
Int. Cl.³ H01Q *13/00*
U.S. Cl. 343—778 **14 Claims**



1. A compact, electronically scanned waveguide antenna comprising:

(1) a continuous sinuous waveguide feed structure including

(a) a first bank of a selected number of straight rectangular waveguide sections horizontally disposed in parallel with the vertical broad sidewall of a section contiguous with the broad vertical sidewall of an adjacent section,

(b) a second bank of said selected number of straight rectangular waveguide sections horizontally disposed in parallel having their broad vertical sidewalls contiguous, said second bank disposed immediately below said first bank a distance essentially equal to the thickness of said first bank such that each one of said straight sec-

tions of said second bank is directly below and essentially parallel with a corresponding straight section in said first bank,

(c) 180° horizontal waveguide bends coupling alternate straight sections at one end of said first bank and at the corresponding end of said second bank,

(d) 180° vertical waveguide bends coupling said corresponding straight sections of said first and second banks at the other end thereof;

(2) an input for receiving swept-frequency electromagnetic energy coupled to the first straight section of said first bank;

(3) a waveguide termination coupled to the last straight section of said first bank; and

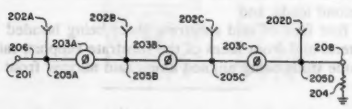
(4) a multiplicity of radiating elements disposed in parallel and formed from straight waveguide sections with one of said multiplicity of elements having its narrow wall contiguous with and coupled to the narrow wall of each alternate straight section in said first bank and one of said multiplicity of elements coupled to each alternate straight section in said second bank, said elements disposed between said first and second bank wherein each radiating element is parallel and contiguous to a straight section in said first and second banks thereby forming an array of contiguous open waveguide ends from which electromagnetic energy is radiated in a narrow beam in azimuth, said beam being scanned in azimuth responsive to said varying frequency.

4,348,681

SERIES FED PHASED ARRAY ANTENNA EXHIBITING CONSTANT INPUT IMPEDANCE DURING ELECTRONIC SCANNING

Peter J. McVeigh, Hauppauge, and Ronald M. Rudish, Commack, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 29, 1980, Ser. No. 182,381
Int. Cl.³ H01Q *3/34*
U.S. Cl. 343—854 **11 Claims**



1. A traveling wave distribution system for a phased array antenna, comprising:

(a) means for propagating an electromagnetic signal, said means having an input port and an output port,

(b) a plurality of means for coupling from the means for propagating to the antenna elements in the phased array, said means for coupling supplying the antenna elements in series and said means for coupling being positioned along the means for propagating at nonresonant points,

(c) a plurality of antireciprocal means for shifting the phase of the electromagnetic signal, each of the means for shifting the phase remaining substantially antireciprocal over the useful scanning range of the array and being connected in series with the means for propagating between the means for coupling,

(d) a resistive termination connected to the output port of the means for propagating, and

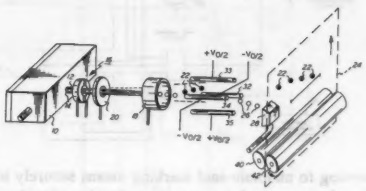
(e) means for controlling the phase shift of the plurality of antireciprocal means for shifting the phase to produce an equal phase shift through each of such elements.

4,348,682

LINEAR INK JET DEFLECTION METHOD AND APPARATUS

Roger G. Markham, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1981, Ser. No. 275,090
Int. Cl.³ G01D *15/18, 18/00*
U.S. Cl. 346—1.1 **11 Claims**



7. In an ink jet printer of the type wherein ink under pressure is forced from a plurality of ink jet nozzles toward a moving recording medium, a process for controlling the trajectory of ink forced through said nozzles comprising the steps of:

controllably deflecting ink columns from each of said nozzles to cause said columns to sweep from side to side in a direction transverse to recording medium movement,

perturbing said ink to insure said plurality of columns break up into droplets at a specified distance from said nozzles,

charging said ink droplets at the point of droplet formation according to a scheme whereby those droplets having a first polarity charge strike said recording medium and those droplets havng a second opposed polarity charge miss said medium and are recirculated for subsequent use by said printer,

generating a steady state electric field through which droplets of either charge must pass in their trajectory toward said recording medium such that droplets having said first polarity charge are deflected or defocused in a direction transverse to recording medium movement thereby amplifying the earlier provided controlled deflection, and

catching or intercepting droplets with said opposed polarity charge as they are defocused away from said medium by said steady state field.

4,348,683

CHART RECORDING APPARATUS

Everett O. Olsen, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Division of Ser. No. 923,009, Jul. 10, 1978, Pat. No. 4,310,841, which is a division of Ser. No. 641,075, Dec. 15, 1975, Pat. No. 4,123,696, which is a division of Ser. No. 543,443, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 333,997, Feb. 20, 1973, abandoned. This application Aug. 17, 1981, Ser. No. 293,392
Int. Cl.³ G01D *11/16*
U.S. Cl. 346—31 **5 Claims**

1. Recorder apparatus comprising:

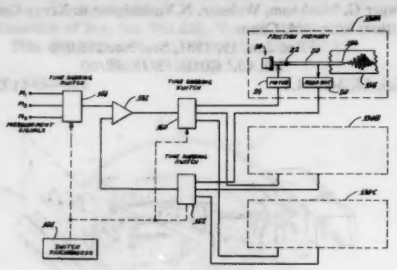
movably-mounted marking means for producing a mark on a chart record;

actuator means responsive to an input signal and operable to apply a force to said marking means to move it towards a new position;

feedback means for producing a feedback signal proportional to the position of said marking means and for directing said feedback signal to said actuator means to oppose said input signal, so that the marking means is driven to a position corresponding to said input signal; and

friction means restraining movement of said marking means, said friction means comprising a mass of small magnetized particles engaging the surface of a part movable with said marking means, to produce a friction restraint which is

relatively small at initial movement of said marking means away from a start point and which thereafter grows in magnitude as the movement continues, said friction means



serving to maintain said marking means securely in position during periods intervening activation of said actuator means.

4,348,684

DEVICE FOR REMOVING EXCESS PIGMENT FROM THE SURFACE OF THE IMAGE CARRIER OF A NON-IMPACT PRINTING MACHINE

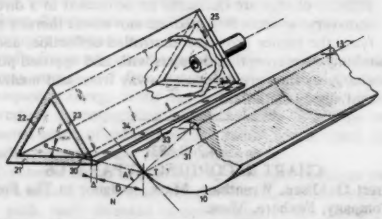
Jean-Jacques Binder, Valdoie, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 965,412, Dec. 1, 1978, abandoned. This application Nov. 25, 1980, Ser. No. 210,312

Claims priority, application France, Dec. 12, 1977, 77 37289

Int. Cl.³ G03G *15/00*

U.S. Cl. 346—153.1 **7 Claims**



1. A device for removing excess particles of pigment from a surface on which a powdered pigment has been deposited and adhered, comprising:

a pneumatic pressure device for establishing a positive air pressure, and

a chamber having at least an entrance orifice connected to said pressure device, and an exit orifice disposed opposite the said surface and extending in a direction parallel to said surface, said exit orifice having a width between 0.2 mm and 0.02 mm, said chamber comprising two plates disposed on either side of and forming said exit orifice, said plates being inclined to one another and terminated by two mutually parallel edges along said exit orifice, one of said edges being set back from the other edge by a distance at least equal to 1 mm,

said device being disposed relative to said surface so that the path followed by the gas emerging from the exit orifice of said chamber forms, with a normal to said surface at the point where said path strikes that surface, an angle at least equal to 30°.

4,348,685

WRITING HEAD FOR AN ELECTROSTATIC POINT PRINTER

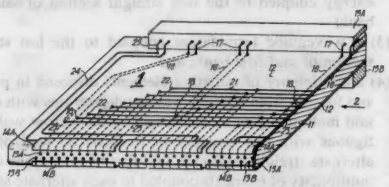
Alain Jaouannet, 5, rue E. Branly; Louis G. Henaff, Pon an Allée, both of Perros Guirec, France (22700), and Jean-Pierre R. Ramy, 3, Résidence Duroux, Lannion, France (22300)

Filed May 13, 1980, Ser. No. 149,422

Claims priority, application France, May 14, 1979, 79 12225

Int. Cl.³ G03G *15/048*

U.S. Cl. 346—155 **10 Claims**



2. A printed head for an electrostatic point printer comprising:

a rigid substrate support having the shape of a rectangular prism having two large lateral faces and a narrow front face;

a flexible dielectric substrate sheet, said sheet having first and second faces with a thickness between the first and second faces;

a connector mechanically connected to said substrate support and responsive to signals for controlling printing;

a plurality of first parallel conductive leads extending in a first direction printed on the first face of said substrate sheet electrically connected to the connector to be responsive to the signals;

aligned electrode studs passing through said thickness of said substrate sheet, each of said studs being in ohmic contact with a respectived one of said first conductive leads and being flush with said substrate sheet second face;

a plurality of parallel second conductive leads extending in a second direction perpendicular to said first direction, printed on said second face of said substrate sheet;

through contacts passing through said thickness of said substrate sheet, each of said contacts making an ohmic contact between one of the first leads and one of the second leads; and

said first face of said substrate sheet being bonded to said lateral and front faces of the substrate support, said electrode studs being aligned along said narrow front face.

4,348,686

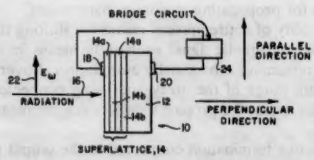
MICROWAVE-INFRARED DETECTOR WITH SEMICONDUCTOR SUPERLATTICE REGION

Leo Esaki, Chappaqua, and George A. Sai-Halasz, Mount Kisco, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1980, Ser. No. 172,794

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **10 Claims**



1. A semiconductor device adapted for operation as a detec-

tor and/or mixer of electromagnetic radiation and whose operating range extends from DC into the infrared region of the electromagnetic spectrum, comprising:

a body of semiconductor material including a superlattice region having two different materials arranged alternately in a plurality of parallel planar layers, said planar layers having a respective predetermined relatively thin thickness dimension of a value wherein an impinging electric field parallel to said planar layer increases the carrier energy in the plane of said layers to the extent that the perpendicular carrier mobility transverse to the plane of said layers is affected and reduced thereby;

electrode means on said body of semiconductor material for sensing current resulting from said perpendicular carrier mobility in response to incident radiation; and

means for directing incident radition on said superlattice structure in a direction perpendicular to said parallel planar layers whereby an accompanying transverse electric field is applied in a direction parallel to said planar layers.

4,348,687

CLAMPING ASSEMBLY FOR THYRISTOR COLUMN

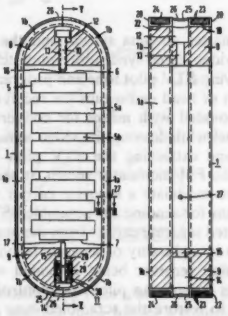
Roman Keller, Neunkirchen, and Günter Kliesch, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 26, 1980, Ser. No. 124,724

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909138

Int. Cl.³ H01L *23/42, 23/44, 23/46*

U.S. Cl. 357—79 **19 Claims**



1. In a thyristor column having a stack of thyristors and cooling capsules, two end pieces, each end piece having a clamping element, and a frame-like clamping device surrounding the stack the end pieces in an electrically insulating manner, and each clamping element resting on an apposite end of the stack and at least one of the clamping elements being resilient, the improvement comprising:

the frame-like clamping device having two identical half-shells of insulating material with continuous outer surfaces and end faces which meet each other, providing a smooth transition of outer surfaces;

each of the two half-shells having at least one straight part and at least one curved part and having two lateral surfaces;

each of the two end pieces lying in an approximately form-fitting manner in a curved part of the clamping device;

at least one groove being arranged on at least parts of the outer surface of each half-shell and parallel to the lateral surfaces thereof; and

a bundle comprising more than one turn of fibers wound in the groove and embedded in a casting compound.

4,348,688

MULTIBEAM CATHODE RAY TUBE APPARATUS

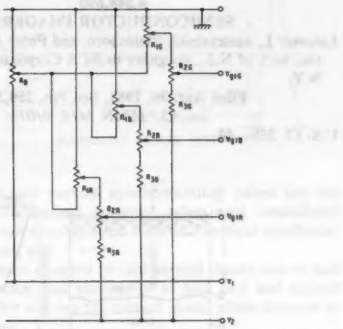
Frank Ainscow, Hampshire, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1980, Ser. No. 175,996

Claims priority, application United Kingdom, Aug. 31, 1979, 7930261

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—29 **13 Claims**



1. Multibeam cathode ray tube apparatus comprising a cathode ray tube including means to generate a plurality of electron beams, a control grid for each beam, and a brightness control incorporating a source of variable voltage for varying the brightness of the display, characterized in that between said variable voltage source and all save at most one of said control grids there is provided means for applying a linear transformation to said variable voltage so that the transformed brightness versus voltage characteristic substantially coincides with a predetermined characteristic.

4,348,689

PHASE ADJUSTING SYSTEM FOR CARRIER CHROMINANCE SIGNAL

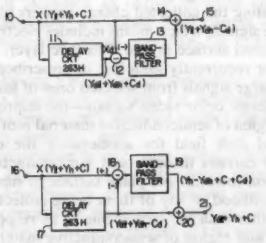
Masahiko Achiha, Iruma, Japan, assignor to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,744

Claims priority, application Japan, Sep. 12, 1979, 54-116204

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **7 Claims**



1. A circuit arrangement for changing a phase of a carrier chrominance signal of a composite color television signal comprising:

a source of a composite color television signal in which a chrominance subcarrier modulated with chrominance components is superimposed on a luminance signal;

a delay means for delaying said composite color television signal by one-field period;

a means for producing a difference signal between said

composite color television signal and an output signal of said delay means;

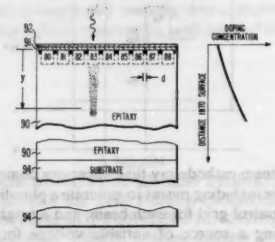
a filter for extracting a high frequency component of said difference signal; and

an adder means for adding an output signal of said filter to said composite color television signal to change the phase of the carrier chrominance signal of said composite color television signal.

4,348,690
SEMICONDUCTOR IMAGERS

Lubomir L. Jastrzebski, Plainsboro, and Peter A. Levine, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,360
Int. Cl.³ H04N *3/14, 9/07*
U.S. Cl. 358—44 **9 Claims**



1. In a charge-coupled-device imager system having:

an optical lens system for projecting a light image in a plane;

a color discriminating optical filter, included in said optical system, for causing said projected light image to be projected in a prescribed pattern of separated colors;

a charge-coupled-device including

a region of semiconductive material arranged so said light image is projected thereinto for generating charge carriers at sites therein, said region of semiconductive material having a plane surface normal to the direction of projection of said light image into said region of semiconductive material including

a dielectric layer having a first surface at the plane surface of said region of semiconductive material and having a second surface opposing its first surface, and including

means inducing potential wells in said region of semiconductive material adjacent to its plane surface, for collecting charge carriers generated in their respective vicinities and integrating the collected charge carriers to form respective charge signals, which means includes electrodes disposed on the second surface of said dielectric layer; and

means for recurrently sampling in prescribed temporal order the charge signals from selected ones of said potential wells to generate color video signals—the improvement wherein said region of semiconductive material is of a type having an internal drift field for accelerating the diffusion of said charge carriers through said semiconductive material in a direction towards said plane surface to substantially reduce the likelihood of any of them being collected in a potential well other than the closest one to its respective generation site in said region of semiconductive material.

2. A semiconductor imager comprising:

a semiconductor region having a front and a back surface, receptive of an image projected through one of its surfaces;

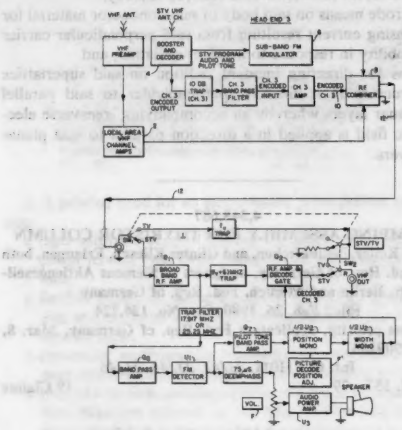
means for inducing potential wells in the front surface of said semiconductor region; and

an impurity concentration gradient in said semiconductor region between said front and back surfaces providing a built-in electric field gradient for accelerating the charge carriers created in response to the image projected onto its image receiving surface, and directing the charge carriers from the charge generation sites to said potential wells along paths predominantly normal to said front surface.

4,348,691
MASTER ANTENNA SUBSCRIPTION TELEVISION SYSTEM AND THE LIKE

Kantilal Mistry, Freehold, N.J., assignor to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Nov. 10, 1980, Ser. No. 205,528
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—114 **3 Claims**



1. In a master antenna system and the like for receiving scrambled video signal sync subscription television signals and the like, having STV pilot tone and program audio signals, the combination of head end means for receiving UHF STV signals and provided with means for converting the same to a VHF channel while leaving the video signal sync in its scrambled state and extracting the STV pilot tone and program audio signals; FM modulator means at said head end means connected to modulate a separate carrier with the extracted signals; means for sending the scrambled STV signals and the FM modulated separate carrier from the head end means along cable means to a plurality of separate television receivers; and each television receiver being provided with simplified decoder means comprising pilot-tone controlled R F decoding gate means to restore the scrambled sync to produce an unscrambled video signal, and FM detector means for demodulating said pilot tone to enable such control of the gate means and demodulating said program audio signals.

4,348,692
VTR WITH EQUALIZER

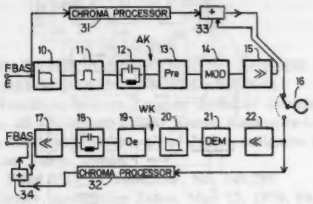
Andreas Ilmer, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 129,838
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950764
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—127 **2 Claims**

1. An arrangement for equalizing a video signal in a system in which the video signal is recorded in frequency modulated form and then played back upon frequency demodulation,

wherein, in addition to a pre-emphasis circuit with an emphasizing factor in the recording channel, and similarly in addition to a de-emphasis circuit in the playback channel, a group-delay equalization circuit for the video signal is provided

such that in a curve representing the frequency response on the output side of the frequency modulator, overshoot spikes of opposite polarity are simultaneously and substantially symmetrically produced for a black/white transition as well as a white/black transition, of the incoming video signal



and such that, in light of the attendant reduction in overshoot, the emphasizing factor is increased until the overshoot limits represented by the maximum and minimum permissible frequencies of the system have been reached.

4,348,693

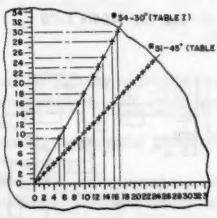
TELEVISION WEATHER RADAR SYSTEM

Jack D. Cauldwell, Carroll, Ohio, assignor to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 34,898, Apr. 30, 1979. This application May 1, 1980, Ser. No. 145,631

Int. Cl.³ H04N *5/02*

U.S. Cl. 358—140 **13 Claims**



1. Method for transmitting data generated in polar coordinate format from a weather radar having a rotating antenna to a remote location for storage in a rectangular coordinate format, the method comprising the steps of

dividing the radar data in polar coordinate format into picture elements,

selecting those picture elements having a corresponding position within a rectangular coordinate format,

transmitting the selected picture elements to the remote location, and

storing the selected picture elements at predetermined locations within a memory at the remote location.

4,348,694

HORIZONTAL PHASE DETECTOR GAIN CONTROL

Michael McGinn, Tempe, Ariz., assignor to Motorola, Inc., Schaumberg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,604

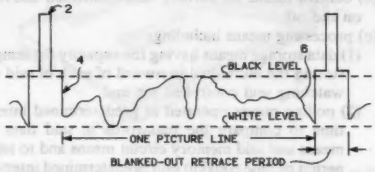
Int. Cl.³ H04N *5/04*

U.S. Cl. 358—158 **9 Claims**

1. An apparatus for altering the loop bandwidth of a horizontal phase lock loop in a television receiver by changing the gain of a phase detector within the phase lock loop, said television receiver receiving horizontal and vertical synchronization pulses and including a vertical countdown counter which is reset by a vertical countdown counter reset signal; comprising:

first means for detecting coincidence between a predetermined state of said countdown counter and said vertical synchronization pulses;

second means coupled to said first means for generating a first potential when said countdown counter is synchronized with said vertical synchronization pulses and for generating a second potential when said countdown counter is not synchronized with said vertical synchronization pulses; and



switching means coupled to said second means and to said phase detector and responsive to said first and second potentials for altering the current in said phase detector to alter its gain.

4,348,695

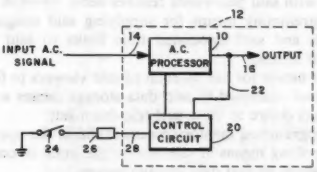
NOISE PROCESSOR DEFEAT SWITCH

Alain H. d'Hautecourt, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 187,222, Sep. 15, 1980, abandoned. This application Nov. 10, 1980, Ser. No. 205,824

Int. Cl.³ H04N *5/14*

U.S. Cl. 358—160 **11 Claims**



1. In a television receiver of the type having an AC signal processing circuit including an output terminal and means enableable for developing a constant level current signal for rendering said processing circuit operative, the improvement comprising:

switch means having a single output conductor, said switch means being selectively operable for developing only a first control signal or only a second control signal on said single output conductor; and

control means connected to said single output conductor and operable in response to said first control signal for enabling the development of said constant level current signal and operable in response to said second control signal for inhibiting the development of said constant level current signal while causing said output terminal to assume a controlled DC voltage level.

4,348,696

TELEVISION VIEWING CONTROL DEVICE

Galen C. Beier, 1200 Kaplan St., Waterloo, Iowa 50702

Filed Sep. 8, 1980, Ser. No. 185,226

Int. Cl.³ H04N *5/44*

U.S. Cl. 358—188 **7 Claims**

1. A television viewing control device for recording the

viewing time of a plurality of viewers watching a controlled television set, and turning said set off when a predetermined viewing time limit of any one of said viewers is exceeded, said control device comprising:

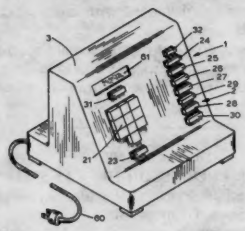
(a) a memory circuit means having the capacity for semipermanently storing an assigned individual password for each of said viewers and a predetermined viewing time associated with each of said passwords;

(b) control means for turning said controlled television set on and off;

(c) processing means including:

(1) data storage means having the capacity for temporarily storing the individual password of each of said viewers watching said controlled set, and

(2) polling means operated at predetermined intervals of time to compare the passwords in said data storage means and said memory circuit means and to subtract a period of time equal to said predetermined interval from the viewing time associated with each of said passwords in said data storage means;



(d) a first means to actuate said control means to turn said television set off when any one of said time limits associated with said passwords reaches zero;

(e) programming means for supplying said assigned passwords and said associated time limits to said memory circuit means,

(f) input means for use by each of said viewers to feed their assigned password to said data storage means when said viewers desire to view said television set;

(g) a programmed memory means to direct the operation of said polling means in response to the input of one of said passwords to said data storage means;

(h) a second means to actuate said control means to turn said controlled set to an on condition in response to the input of at least one of said passwords to said data storage means; and

(i) clock means for providing internal timing for said polling means.

4,348,697
FACSIMILE APPARATUS

Shuichi Takahashi, Sagamihara; Fumihiro Ogasawara, Kawasaki, and Syuichi Ohta, Atsugi, all of Japan, assignors to Ricoh Company, Limited, Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,258

Claims priority, application Japan, Apr. 16, 1979, 54-46223

Int. Cl.³ H04N *1/04, 1/10, 1/14*

U.S. Cl. 358—286 **6 Claims**

1. A facsimile apparatus comprising:

a reading head;

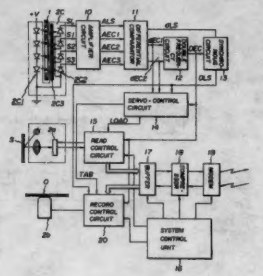
a recording head;

a carriage means on which said reading head and said recording head are mounted and which can be reciprocated in the main scanning direction;

a scale plate having a plurality of slits formed therein in the main scanning direction with a predetermined pitch;

a detector means which is mounted on said carriage and which traces said scale plate as said carriage means is reciprocated and which outputs a predetermined signal corresponding to each of said slits; and

a D.C. motor for reciprocating said carriage means, the speed of said D.C. motor and the speed of said carriage means in



the main scanning direction thereof being controlled in accordance with said signal output from said detector means so that said carriage means is caused to run at a constant speed.

4,348,698
MAGNETIC DEVICES FOR CHANGING VIDEO RECORDINGS

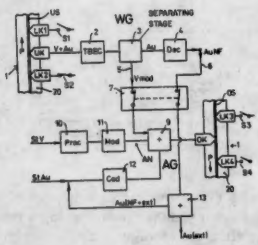
Klaus D. Schomann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 87,555

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847440

Int. Cl.³ H04N *5/78*

U.S. Cl. 360—14 **9 Claims**



1. In a video recording/playback system having recording and playback heads for recording signals on, and playing signals back from, a recording medium having a plurality of parallel tracks,

a method for audio-dubbing in a single recording/playback unit, the originally recorded signals, which last-mentioned signals have been recorded in modulated form, with an existing audio component, on a first of said tracks, said method comprising:

playing the modulated signals back from said first track,

separating the audio component of the played back signal from the undemodulated video component of said signal,

demodulating the separated audio component for reducing said audio component to base band,

providing at audio base band an audio signal to be dubbed in,

combining the audio component reduced to base band and the base band audio signal to be dubbed in, and encoding the audio combination,

combining the encoded audio combination with said undemodulated video component,

rerecording the combined video and audio signal on a second of said plurality of tracks, and

erasing said originally recorded signals after at least temporary rerecording, in order to vacate said first track for further new recordings.

4,348,699

APPARATUS FOR RECORDING AND/OR REPRODUCING DIGITAL SIGNAL

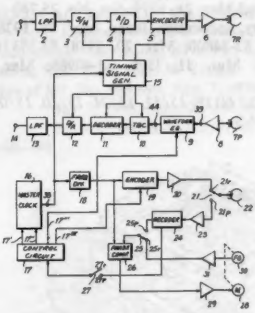
Yoshikazu Tsuchiya; Masato Tanaka; Takenori Sonoda; Tetsu Watanabe, all of Tokyo; Chiaki Kanai, Kanagawa-ken, and Nobuhiko Watanabe, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,299

Claims priority, application Japan, May 15, 1979, 54-59254

Int. Cl.³ G11B *5/00, 5/09*

U.S. Cl. 360—32 **11 Claims**



1. An apparatus for digitally recording an analog signal on a movable recording medium, with a predetermined data density, comprising:

means for generating fundamental clock pulses having a selected clock frequency;

means for sampling said analog signal at a sampling frequency which is related to said selected clock frequency;

means for digitizing the samples from said means for sampling;

means including a transducer for recording the digitized samples on said recording medium; and

means for moving said recording medium at a speed which is varied in response to changes in said selected clock frequency such that said samples are recorded on said medium with said predetermined data density independently of said sampling frequency.

4,348,700

ERASE ATTACHMENT FOR TAPE CASSETTES

Jerry Iovino, 2 Geraldine Rd., North Arlington, N.J. 07032

Continuation-in-part of Ser. No. 970,118, Dec. 18, 1978. This application Apr. 22, 1980, Ser. No. 142,777

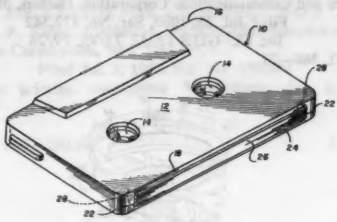
Int. Cl.³ G11B *15/04*

U.S. Cl. 360—60 **10 Claims**

1. An erasing attachment for a conventional tape cassette having spaced erase openings in a portion thereof, said attachment comprising:

an elongated body portion of a length sufficient to extend longitudinally along the exterior of the cassette portion from one erase opening to another, and

end portions extending laterally from the ends of said body portion and being removably receivable within the erase



openings to position the attachment on the cassette so that said body portion covers the erase openings.

4,348,701

MODE SWITCHING CIRCUIT

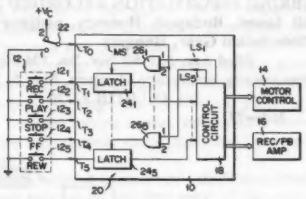
Katsumi Kanayama; Kenzi Furuta, and Kazuyasu Motoyama, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 19, 1980, Ser. No. 151,469

Claims priority, application Japan, May 28, 1979, 54-65837

Int. Cl.³ G11B *15/12*

U.S. Cl. 360—61 **9 Claims**



1. In a mode switching circuit for a multi-mode electronically controlled tape recorder, the mode switching circuit including an operation switch section for issuing operating instruction signals to set the mode of operation of the tape recorder; and a control device including a control circuit for controlling the operation mode of the tape recorder according to the operating instruction signals from the operation switch section, said control device having terminals through which said operation switch section is coupled to said control circuit of said control device,

the improvement wherein said mode switching circuit further comprises: mode switch means coupled to said control device and generating a mode selection signal having a given logic level; and

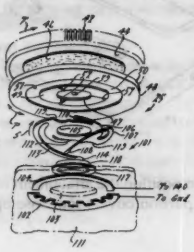
mode selection means coupled to said mode switch means, to said operation switch section and to said control circuit for setting the transmission state of said operating instruction signals from said operation switch section to one of at least two selectable transmission states, and for coupling said operating instruction signals to said control circuit according to the set transmission state as a function of the logical level of said mode selection signal.

4,348,702

DEVICE FOR PREVENTING TAPE WINDUP ON THE CAPSTAN OF A TAPE DECK

Orlando Taraborrelli, Bryn Mawr, Pa., assignor to Ford Aerospace and Communications Corporation, Detroit, Mich.

Filed Jul. 25, 1980, Ser. No. 172,342
Int. Cl.[3] G11B *15/32, 15/43, 19/26*
U.S. Cl. 360—71 7 Claims



1. A device for preventing tape windup on the capstan of a tape deck which includes a tape supply reel, a take-up reel and means for driving said take-up reel in a first predetermined rotational direction and for driving said capstan in a second predetermined rotational direction, comprising:

means mounted to rotate only in said first direction with said takeup reel for sensing the rotation of said take-up reel in said first predetermined rotational direction

means responsive to said sensing means for producing a holding signal only when said take-up reel is sensed as rotating in said first predetermined direction; and

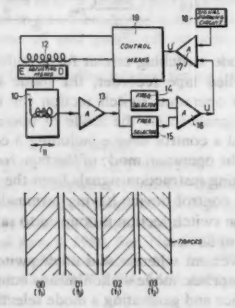
means responsive to only said holding signal for activating said driving means.

4,348,703

FLEXIBLE MAGNETIC DISC HAVING TRACK MARKING INFORMATION RECORDED THEREON

Marcell Jánosi, Budapest, Hungary, assignor to Budapesti Rádiótechnikai Gyár, Hungary

Filed Apr. 2, 1980, Ser. No. 136,560
Claims priority, application Hungary, May 6, 1979, BU 937
Int. Cl.[3] G11B *21/10*
U.S. Cl. 360—77 4 Claims



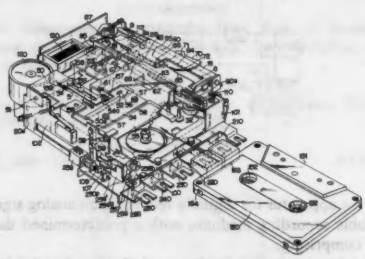
1. An apparatus for fine adjustment of the position of a reading head associated with a flexible magnetic information carrier disc relative to the circular information recording tracks of the disc, in which each of said tracks comprise an information sector and a track-marking sector each track-marking sector having at most about 30° angular width of the respective track, and on every track-marking sector a marking frequency being recorded with a frequency value being distinguishable from the marking frequency recorded on the neighbouring tracks, said apparatus comprising circuit means selective to said marking frequencies and coupled to said reading head for providing an output signal proportional to the amplitudes of the marking frequency components of signals read out by said reading head, and a control unit which in response to said output signal adjusts the radial position of said reading head to control that component of said output signal to a maximum which is associated with said frequency value of the track to which fine adjustment should be made, wherein the tracks with even track numbers comprise a first marking frequency value, and the tracks with odd track numbers comprise a second marking frequency value, and wherein said first and second marking frequency values correspond respectively to frequencies represented by the "0" bits and "1" bits recorded in the information carrying sector of said tracks.

4,348,704

MAGNETIC TAPE RECORDING/REPRODUCING APPARATUS

Satoshi Takagi, and Toshio Watanabe, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 25,740
Claims priority, application Japan, Mar. 24, 1978, 53-32920; Mar. 28, 1978, 53-34800; Mar. 29, 1978, 53-35331; Mar. 31, 1978, 53-36705; Mar. 31, 1978, 53-40988; Mar. 31, 1978, 53-40989
Int. Cl.[3] G11B *15/32, 15/04, 15/10, 15/02*
U.S. Cl. 360—96.5 9 Claims



1. In a magnetic tape cassette recording/reproducing apparatus, said apparatus including a cassette-receiving frame movable from a cassette-receiving position to a cassette recording /reproducing position; first slide means; spring means urging said first slide means into an initial first position; said first slide means having a cassette abutment portion engageable by the cassette being inserted into said cassette-receiving frame when the first slide means is moved into a second position against the return force of the spring means as the user pushes the cassette into the apparatus; locking means for automatically locking said first slide means into said second position when the first slide means reaches the same; cassette-receiving frame moving means for effecting the movement of said cassette-receiving frame from said cassette-receiving position to at least a given second position preparatory to a recording/reproducing operation when said first slide means is moved into said second position where it is locked by said locking means; the improvement for facilitating the easier movement of said cassette against the return force of the spring means operating on said first slide means comprising swaying means positioned to be swayed in first and second directions with movement of said first slide means respectively toward and away from said second position, said swaying means being provided with at least one operating portion; pivotable floating means having opposite end portions provided with projections, respectively, an intermediate side of said floating means confronting said operating portion of the swaying means, and a pair of engaging means for respectively engaging and disengaging said projec-

tions of the floating means as the floating means is moved by said swaying means, spring means for urging one of said engaging means in a first direction said floating means having a cam surface with first and second portions respectively engaged in succession by said operating portion of the swaying means which portion when the swaying means is moved in said first direction as the first slide means moves toward said second position pivots said floating means in a given direction, one of the projections of said floating means then being held by the other of said engaging means which projection forms a pivot point for the floating means while the other projection moves sad one engaging means initially against the spring return force of the spring means operating thereon during the engagement of said operating portion with said first cam surface portion, the force of said other projection on said other engaging means being relieved as said operating portion thereafter engages said second cam surface portion so that the latter spring means aids the further movement of said first slide means toward said second position.

4,348,705

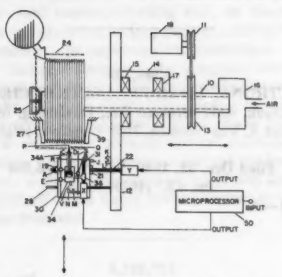
RANDOM ACCESS FLEXIBLE DISK MEMORY

Faquir C. Mittal, Audubon; Frank J. Arrison, Warrington, and Arnold Schonfeld, Norristown, all of Pa., assignors to Sperry Corporation, New York, Nebr.W YORK

Continuation of Ser. No. 958,599, Nov. 7, 1978. This application May 7, 1980, Ser. No. 147,039

Int. Cl.³ G11B *5/012, 21/02*

U.S. Cl. 360—98 **10 Claims**



1. A method for randomly accessing by means of a pair of parallel and unequal length picker arms, which carry a read/write means thereon, a thin, flexible, magnetic multi-track disk from a plurality of closely-spaced, rotating, flexible and axially arranged magnetic disks in a stack having different outside diameters which are arranged in a uniformly ascending order comprising steps of:

(a) rotating said disks in their respective planes of rotation, each said disk being characterized by a natural tendency to flutter while rotating in its dynamic state;

(b) moving the larger of said picker arms by contacting a disk to be accessed while in its dynamic state such that said disk is moved in a direction beyond the range wherein it has a natural tendency to flutter, to a position where said disk becomes relatively stable while rotating;

(c) moving said picker arms radially inward a distance while the accessed disk has become relatively stable, such that free ends of said longer and shorter arms are within diameter dimensions of adjacent disks, to locate said to be accessed disk between said picker arms wherein the disk is positively captured therebetween;

(d) moving said picker arms so as to return said positively captured disk to its normal plane of rotation where said disk may freely rotate between said picker arms for reading or writing information on said disk,

(e) whereby said random accessing is performed with minimum error and relatively rapid access time.

4,348,706

EDGE GUIDE FOR A MAGNETIC TAPE

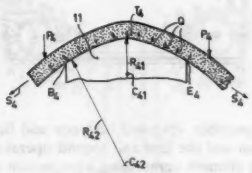
Bernard P. Videc, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,890

Claims priority, application Netherlands, Jul. 6, 1979, 7905278

Int. Cl.³ G11B *15/60*

U.S. Cl. 360—130.24 **8 Claims**



1. An apparatus for recording and/or reading signals arranged in tracks on an elongated tape having substantially parallel longitudinal edges and having a specific resistance to bending in the plane of the tape, comprising:

a tape guide member defining a path between a tape-supporting entry point and a tape-supporting exit point, said member having a tape-supporting edge for supporting one of the longitudinal edges of such a tape accommodated in the apparatus and disposed along said path between said points,

means for sustaining a tape tension of a given magnitude in the longitudinal direction on the tape disposed along said path,

pressure members for exerting transverse pressure forces on the tape, to press the tape against the tape-supporting edge with a transverse force as constant as possible per unit of length between said points, and

means for recording and/or reading signals arranged in tracks on said tape along said path, characterized in that,

the tape-supporting edge has a curvature which is convex toward the tape having a peak substantially midway between the tape-support entry point and the tape-support exit point,

said curvature, relative to an arc of a circle described by said entry and exit points and the peak of the curve, has a slightly smaller radius at the location of the peak and a slightly larger radius substantially midway between the peak and each of said entry and exit points respectively, and

said pressure members are disposed at locations longitudinally spaced beyond said entry and exit points respectively, near said points, so as to subject the tape guided along said edge to a curvature in the plane of the tape in conformity with the convex curvature of the tape-supporting edge.

4,348,707

ANTI ERASE INTERLOCK FOR A MAGNETIC TAPE CASSETTE

Heinrich Maly, and Franz Werner, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,609

Claims priority, application Austria, Jul. 13, 1978, 5074/78

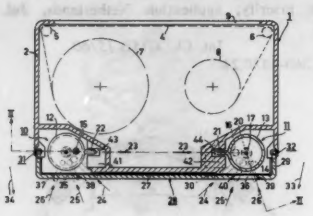
Int. Cl.³ G11B *23/04, 15/04*

U.S. Cl. 360—132 **4 Claims**

1. A magnetic tape cassette for a tape recorder, comprising a housing and at least one anti-erase interlock device, said

device including an actuating member arranged in the cassette to be movable over a defined path between at least first and second operating positions, in one only of said operating positions said member closing an opening formed in the housing,

wherein the actuating member is arranged to be settable to at least one further operating position, and the device further includes a latching element for blocking movement of the



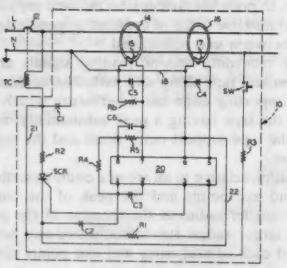
actuating member, disposed between said further operating position and the first and second operating positions, said latching element comprising a projection connected to the cassette housing so arranged as to block movement of the actuating member from the further operating position to said first or second operating positions without disassembly of the cassette.

4,348,708

GROUND FAULT CIRCUIT INTERRUPTING DEVICE WITH IMPROVED COORDINATION OF ELECTRONIC CIRCUIT OPERATION

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,513
Int. Cl.³ H02H *3/33*
U.S. Cl. 361—45 **7 Claims**



1. An integrated circuit for utilization in a ground fault circuit interrupting device including a differential current transformer having a secondary winding in which is developed a fault signal proportional to any imbalance in the currents flowing in the line and neutral conductors of an AC power distribution circuit occasioned by a line to ground fault, a neutral transformer having a primary winding which is driven to develop a differential transformer imbalancing current in the neutral conductor if faulted to ground through a desensitizing low impedance, separable contacts for interrupting at least the line side of the distribution circuit, a trip solenoid, a thyristor operating when triggered into conduction to draw activating current through the solenoid to initiate separation of the contacts, an integrating capacitor and an energy storage filter capacitor, said integrated circuit comprising, in combination:

A. a differential amplifier having a first input connected with the differential current transformer secondary winding for amplifying a fault signal developed therein by a current imbalance exceeding a pre-selected threshold level established by a bias voltage applied to a second amplifier input, said amplifier developing an integrating capacitor charging current of a magnitude exponentially related to the fault signal magnitude;

B. an oscillator connected to drive the primary winding of the neutral transformer;

C. a comparator for sensing the voltage developing across the integrating capacitor;

D. a thyristor gate driver controlled by said comparator for producing gate pulses to trigger the thyristor into conduction when the voltage across the integrating capacitor achieves a pre-established reference level;

E. a clamp connected with said gate driver for inhibiting the triggering of the thyristor; and

F. a power supply including

(1) a first diode conducting half-cycle line current from the distribution circuit onto a first power supply bus,

(2) a regulating means connected with said bus for establishing a regulated supply voltage thereon during a substantial portion of each conducting half-cycle of said first diode,

(3) means responsive to said regulating means for

(a) conditioning said clamp to inhibit triggering of the thyristor while the supply voltage is in regulation,

(b) turning on said oscillator while the supply voltage is in regulation, and

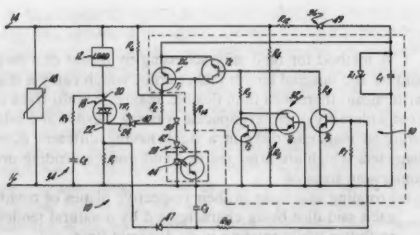
(c) strobing said comparator as said supply voltage achieves regulation to determine if the voltage across the integrating capacitor has achieved said pre-established reference level.

4,348,709

ELECTRONIC LOAD PROTECTION CIRCUIT

Ernest R. Mauk, 4991 Ormand Rd., Davisburg, Mich. 48019, and William A. Van Norman, 2055 Wardlow, Highland, Mich. 48031

Filed Dec. 15, 1980, Ser. No. 216,508
Int. Cl.³ H02H *3/38*
U.S. Cl. 361—92 **9 Claims**



1. A load protecting circuit for interrupting current flow to the load line during voltage drops or current surges in the AC power line comprising:

a first means for sensing a voltage drop in the power line;

a second means for sensing excessive current applied to the load line;

switching means for interrupting and restoring current in the load; and

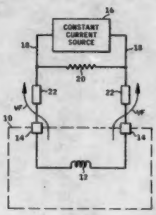
gating means powered by said AC power line exclusively of any separate source responsive to said first and second means for automatically operating the switching means, said gating means comprising an AC line operated, zero-crossing switch means having means for sensing the zero-crossings of the AC line, whereby power for operating the switching means is derived only from the AC line.

4,348,710

METHOD AND STRUCTURE FOR COMPENSATING FOR VARIATIONS IN VAPOR COOLED LEAD RESISTANCE OF SUPERCONDUCTING MAGNETS

Eugene L. Woods, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Jun. 22, 1981, Ser. No. 275,923
Int. Cl.³ H01H 47/00
U.S. Cl. 361—141 13 Claims



1. In a superconducting magnet arrangement having a sealed cryogenic environment utilizing liquid helium, a superconducting coil immersed in the liquid helium, a constant current power supply exterior of the cryogenic environment and connected to said superconducting coil by electrical leads that penetrate the sealed cryogenic environment and are adapted to be cooled by vapor from the helium that is boiled off the helium due to frictional power losses and flux jump power losses within said superconducting coil, an electrical shunt connected to the superconducting magnet exterior of the cryogenic environment, the improvement comprising:

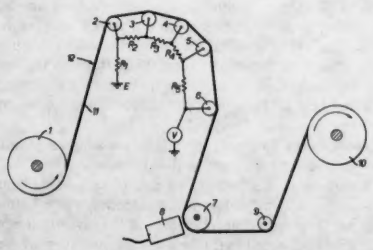
electrical means coupled to the constant current power supply and to the superconducting coil and arranged to be cooled by the same vapor flow applied to said electrical leads whereby the constant current power supply is permitted to maintain a constant current through the superconducting coil and constant resultant magnetic field as variations in the electrical resistance of said leads occur to vapor boil off of the liquid helium within the sealed cryogenic environment.

4,348,711

METHOD AND APPARATUS FOR IMPLANTING A CHARGE IN AN ELECTRET FOIL

Ronald Else, Martlesham, and Michael A. O'Sullivan, Ipswich, both of England, assignors to The Post Office, London, England

Filed Jun. 25, 1980, Ser. No. 162,904
Claims priority, application United Kingdom, Jul. 6, 1979, 7923737
Int. Cl.³ H01G 7/02
U.S. Cl. 361—233 20 Claims



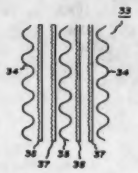
1. A method of implanting an electret charge into a foil capable of retaining an effective electret charge, the method including applying a first electric field and thereafter a second electric field across the foil, the second electric field being of greater magnitude than the first, whereby an effective electret charge is implanted into the foil.

4,348,712

CAPACITOR WITH EMBOSSED ELECTRODES

George R. Newcomb, South Glen Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 952,384, Oct. 18, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,425
The portion of the term of this patent subsequent to Oct. 14, 1980, has been disclaimed.
Int. Cl.³ H01G 4/22
U.S. Cl. 361—315 23 Claims



1. In an electrical capacitor including a casing with electrical terminals thereon and one or more capacitor rolls in said casing and connected to the terminals and a dielectric fluid in the casing and impregnating the roll, the combination of

(a) said roll comprising a pair of spaced metallic electrode foil strips and a dielectric therebetween consisting solely of a synthetic resin material and comprising at least one synthetic resin strip,

(b) said electrode foil strips having a full pattern of continuous uniform dimple-like structures coterminously on the surfaces thereof,

(c) said dimple-like structures providing a foil thickness which is about 2 to 10 times the original thickness before winding in said roll,

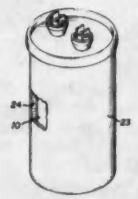
(d) said resin strip comprising polypropylene having one of its surfaces covered by a layer of fibrils forming discontinuities and craters coextensively to provide a film space factor above about 3.0%.

4,348,713

IMPREGNANTS FOR METALLIZED PAPER ELECTRODE CAPACITORS

Frederick Grahame, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Filed May 6, 1980, Ser. No. 147,031
Int. Cl.³ H01G 4/22
U.S. Cl. 361—315 8 Claims



1. In an electrical capacitor comprising a pair of spaced strip electrodes and a synthetic resin film dielectric therebetween to form a laminate which is tightly wound in a roll form and placed in a casing and impregnated with a dielectric fluid, the combination comprising

(a) the said strip electrodes comprising capacitor tissue paper

having both sides metallized with a thick layer coating of aluminum,

(b) and a dielectric fluid impregnating said roll and paper strips,

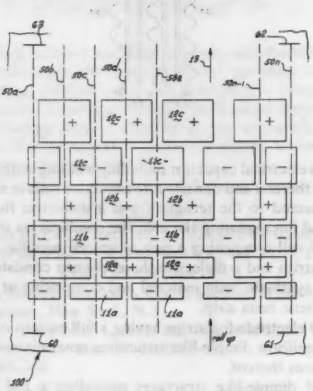
(c) said fluid consisting essentially of a blend of about 25–50 percent by volume of an aromatic hydrocarbon selected from the group consisting of phenyl xylyl ethane, monoisopropyl biphenyl and mixtures thereof and a 50–75 percent by volume of a phthalate ester.

4,348,714

MULTILAYER TUBULAR CAPACITOR AND FABRICATION THEREOF

Clarence L. Wallace, Solana Beach, Calif., assignor to Cladan Incorporated, San Marcos, Calif.

Filed Nov. 14, 1980, Ser. No. 207,028
Int. Cl.³ H01G *1/015, 13/00*
U.S. Cl. 361—328 **8 Claims**



1. In capacitor structure adapted to be cut and rolled up,

(a) a carrier sheet having width and length dimensions, and

(b) metallic ink electrodes on said sheet in spaced relation along the length dimension of said sheet, the electrodes having progressively increasing surface dimension along said sheet length dimension,

(c) said electrodes being arranged in first multiple parallel columns spaced apart laterally along the sheet width dimension, and second multiple parallel columns spaced apart laterally along the sheet width dimension,

(d) lengthwise successive electrodes in the first columns being in widthwise alighnment, and lengthwise successive electrodes in the second columns being in widthwise alignment,

(e) said successive electrodes in each of the second columns projecting laterally between said successive electrodes in each of two of the first columns.

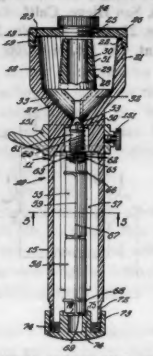
4,348,715

LIGHTED TOOL HOLDER

Leonard R. Christensen, 4205 Fullerton Ave., Chicago, Ill. 60639, and Hiroshi Horibata, Takane-So, 29-18, 5-Chome, Kamirenjaku, Mitaka-Shi, Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 111,841
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—109 **15 Claims**

1. A lighted tool holder for releasably holding a tool, comprising; a holder body having a tool holding adapter mounted centrally therein at one end thereof, said body having a hollow projecting portion at the end opposite the tool holding adapter, a light bulb having a contact ground mounted in the body beneath the adapter, battery means having a contact and a ground in the hollow projecting body portion axially movable therein to effect electrical contact with the bulb contact, a holder for the battery means including a spring wire surrounding said battery means and providing electrical contact with the bulb contact, a holder for the battery means including a



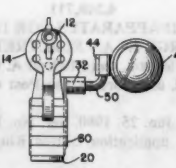
spring wire surrounding said battery means and providing electrical contact between the battery ground and the bulb ground, and an end cap threadedly engaging the hollow body portion for axially shifting the battery means into electrical contact with the light bulb.

4,348,716

FLASHLIGHT GUN MOUNT

Nelson Storm, and Gregory A. Storm, both of 213 Perry, Rossville, Ill. 60963

Continuation-in-part of Ser. No. 79,190, Sep. 26, 1979, abandoned. This application Jul. 23, 1980, Ser. No. 171,322
Int. Cl.³ F41G *1/34;* **F21M** *9/00;* **F21L** *1/00*
U.S. Cl. 362—188 **9 Claims**



1. A flashlight mounting bracket assembly for adjustably mounting a flashlight on a gun whereby the beam of light produced by the flashlight may be adjusted so that it generally coincides with the line of sight taken through the bore of the gun barrel, said mounting bracket assembly comprising:

a first bracket and support means adapted for securement to the gun,

a second bracket and suppoert means adapted for attachment to and for support of a flashlight, and

pivot arm means comprising a rod-like portion bent at right angle to form an outwardly extending pair of arms at right angle to each other, one arm of the pivot arm being rotatably connected to the first bracket and support means, and the other arm being rotatably connected to the second bracket and support means whereby the flashlight held by the second bracket and support means has freedom of adjustability in the horizontal and vertical positions.

4,348,717

LUMINAIRE LOWERING DEVICE WITH CENTERING MEANS

Richard L. Thompson, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,368
Int. Cl.³ F21V 21/36
U.S. Cl. 362—403 10 Claims

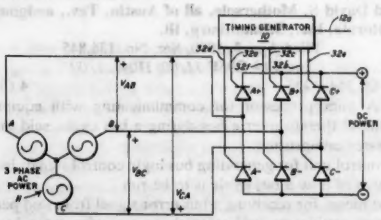
1. Centering apparatus for maintaining a ring-like luminaire support substantially coaxial with a pole on which the support is adapted to be mounted comprising, in combination, a ring-like support member, a plurality of generally U-shaped guide members each having opposite arms securing said guide members at circumferentially spaced locations on said support member for movement of said guide members toward and away from the axis of said support member, the maximum radial extent of said guide members toward the axis of said support member being less than the radius of said support member, resilient means on said guide members constantly urging the respective guide members toward the axis of said support member for yieldably engaging the proximate surface of the pole, each of said generally U-shaped guide members being respectively entirely on one side of the pole when said support member is mounted encircling the pole, whereby when said ring-like support member is mounted encircling the pole and moved up and down therealong, said support member is automatically maintained in substantial coaxial alignment with the pole.

4,348,718

TIMING GENERATOR FOR USE WITH MULTI-PHASE CONTROL RECTIFIER SYSTEMS

Donald E. Vollrath, Greenfield, Wis., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Feb. 12, 1981, Ser. No. 234,064
Int. Cl.³ H02P 13/24
U.S. Cl. 363—87 13 Claims



1. For use with a multi-phase rectifier system of the type including a plurality of selectively gateable semiconductive devices coupled between a multi-phase power source and a d.c. load and arranged to couple rectified D.C. voltage across the load,

a timing generator for selectively gating appropriate semiconductive devices at appropriate power line phase angles so as to controllably vary the rectified voltage, the timing generator comprising:

means for producing a first signal having unique values representative of respective power line phase angles;

comparator means adapted to receive a command signal indicative of the ignition phase angle at which gating is desired and for comparing the first and command signal values; the comparator means undergoing a transition in output state when the two signals are substantially equal;

sequence means having a plurality of sequentially occuring output states and being responsive to the comparator means transition to assume the sequentially next output state when gating occurs,

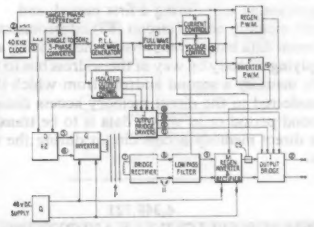
the sequence means including first decoding means responsive to the output states to couple uniquely respective semi-conductive devices to a source of gating pulses in accordance with the ignition pattern associated with the multi-phase source.

4,348,719

STATIC INVERTER WITH ENERGY RETURN

Graham P. Hicks, Guildford, and Michael C. Carter, Dorking, both of England, assignors to ERA Patents Limited, Leatherhead, England

Filed Oct. 19, 1979, Ser. No. 86,359
Claims priority, application United Kingdom, Oct. 23, 1978, 41632/78
Int. Cl.³ H02M 7/537
U.S. Cl. 363—132 24 Claims



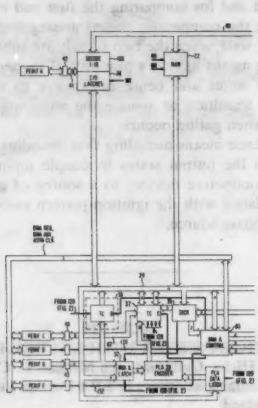
15. A static inverter for connection to a d.c. supply to provide a relatively low-frequency alternating voltage output, comprising: means to generate a first train of electrical pulses of relatively high frequency; means to cause successive pulses of said first train to represent required successive instantaneous unidirectional amplitudes of said alternating voltage output which is to be provided; a transformer having primary and secondary windings; means to cause the passage through said transformer primary winding of pulses of current from said d.c. supply in response to said first pulse train so that a corresponding second pulse train is induced across said transformer secondary winding; means to produce from said second pulse train a unidirectional voltage having said required instantaneous amplitudes; switching means to which said unidirectional voltage is fed and which cyclically reverses the polarity of said voltage at said relatively low frequency to produce said alternating voltage output; and means operative selectively to by-pass said bridge circuit to provide a reverse path through the inverter from the output to the d.c. supply in the event of excess power being available at the inverter output due to load conditions existing on said output.

4,348,720

MICROCOMPUTER ARRANGED FOR DIRECT MEMORY ACCESS

Donald E. Blahut, Holmdel; Victor K. Huang, Scotch Plains, and Richard L. Townsend, Jr., Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1979, Ser. No. 71,750
Int. Cl.[3] G06F *1/00*
U.S. Cl. 364—200 **14 Claims**



1. A microcomputer system fabricated on a single chip comprising an addressable memory (**20,22**) and a processing unit (**27, 30, 32, 70, 96**) interconnected by an internal data bus (**24**); addressing means (**60, 62, 78, 99, 102**) connected by way of an address bus (**40**) to the addressable memory for applying by way of the address bus a first address from which data is read to the processing unit during a first period; and

a direct memory access circuit (**85**) interconnected with the internal data bus; the addressing means being arranged for applying directly by way of the address bus to the addressable memory a second address, from which data is to be transferred to the direct memory access circuit during a second period or to which data is to be transferred from the direct memory access circuit during the second period.

4,348,721

SYSTEM FOR SELECTIVELY ADDRESSING NESTED LINK RETURN ADDRESSES IN A MICROCONTROLLER

David A. Brereton, and Buddy F. Stansbury, both of San Jose, Calif., assignors to International Business Corporation, Armonk, N.Y.

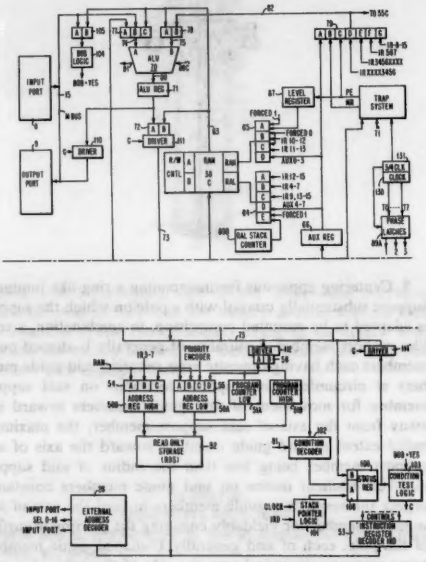
Division of Ser. No. 921,147, Jun. 30, 1978, Pat. No. 4,276,595. This application Mar. 26, 1980, Ser. No. 133,991
Int. Cl.[3] G06F *9/22*
U.S. Cl. 364—200 **14 Claims**

1. In a microprocessor having a memory for storing a plurality of different instructions at individually addressable locations, and means for controlling the operation of said microprocessor to execute each one of said instructions in accordance with the information contained in said instruction during one machine cycle; and

means for transferring the next instruction from said memory to said controlling means during the execution of a current instruction including means for addressing a location in said memory of said next instruction;

a storage means having a plurality of storage locations for storing link addresses transferred from said addressing means of said memory during the execution of certain link type instructions which cause said addressing means to branch to an address which is not the next sequential address to permit a return to said branch point by another instruction at a subsequent time;

means for addressing said storage means during the execution of said certain link type instructions including means for incrementing said storage addressing means when a plurality of said link type instructions are executed in a sequence without the execution of said another instruction resulting in a nested link condition wherein said plurality of storage locations each contain a link address associated with one of



said plurality of said executed link type instructions, the improvement comprising:

means for transferring any selected one of said link addresses from said storage means to said memory addressing means in response to said another instruction including means for resetting said storage addressing means to select said any one of said nested link addresses, said link address transferring means and said link address resetting means being operable in response to signals from said means for controlling during the execution of said another instruction.

4,348,722

BUS ERROR RECOGNITION FOR MICROPROGRAMMED DATA PROCESSOR

Thomas G. Gunter, Lester M. Crudele, John E. Zolnowsky, and David S. Mothersole, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1980, Ser. No. 136,845
Int. Cl.[3] G06F *11/00*; H04L *1/00*
U.S. Cl. 364—200 **4 Claims**

3. A microprocessor for communicating with equipment peripheral thereto over a bus during a bus cycle, said microprocessor comprising:

a control unit for generating bus logic control signals indicative of how a bus cycle is to be run

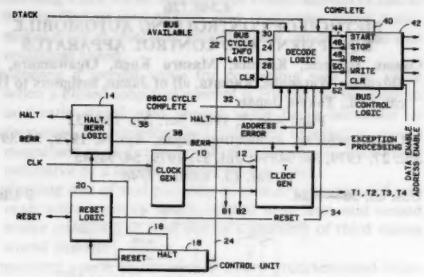
first means for receiving a bus error signal from said peripheral equipment indicating that a transfer error has occurred during said bus cycle;

second means for receiving a halt signal from said peripheral equipment indicating that the bus cycle associated with said error signal should be rerun;

third means coupled to said first and second means and to said control unit, for forcing a bus control logic means to rerun said bus cycle when said halt signal terminates, said third means comprising:

storage means for storing said bus logic control signals;

fourth means for resetting said storage means to a predetermined state in response to said error signal; and



fifth means for disabling said fourth means when said halt signal is present so as to prevent resetting said storage means in response to said error signal;

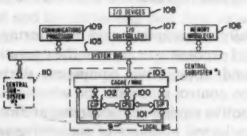
said bus control logic means coupled to said third means and to said bus, for running said bus cycle, including generating bus control signals via said bus for controlling the use of said bus by said peripheral equipment, in response to said stored bus logic control signals.

4,348,723

CONTROL STORE TEST SELECTION LOGIC FOR A DATA PROCESSING SYSTEM

William E. Woods, Natick; David E. Cushing, Chelmsford, and Philip E. Stanley, Westboro, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 15, 1980, Ser. No. 140,642
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—200 **6 Claims**



1. A data processing system comprising:

means for receiving a plurality of test signals, each of said test signals having either a first polarity or a second polarity indicative of the status of various elements included in said system, and for generating a plurality of selected output signals comprising selected ones of said received test signals;

first multiplexer means having a plurality of first multiplexer inputs and a first selector enable terminal, said first multiplexer means for generating a first multiplexer output;

second multiplexer means having a plurality of second multiplexer inputs and a second selection enable terminal, each of said second multiplexer inputs corresponding to a different one of said plurality of first multiplexer inputs, said second multiplexer means for generating a second multiplexer output;

first means for coupling each of said plurality of selected output signals from said receiving and generating means to a different one of said first multiplexer inputs and corresponding second multiplexer inputs;

a control store having a first part and a second part, said first part of said control store having a first plurality of addressable storage locations for storing control store words and a first address enable terminal, said second part of said control store having a second plurality of addressable storage locations for storing control store words and a second address enable terminal, said control store words for use in controlling the operation of said system;

second means for coupling the output of said first multiplexer means to said first address enable terminal and for coupling the output of said second multiplexer means to said second address enable terminal; and

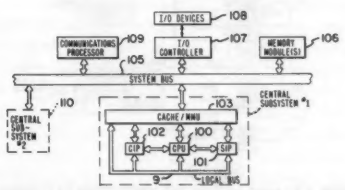
third means for coupling one of said test signals to said first selection enable terminal and to said second selection enable terminal to control said first multiplexer means to generate said first multiplexer output responsive to said one test signal having said first polarity and to control said second multiplexer means to generate said second multiplexer output responsive to said one test signal having said second polarity.

4,348,724

ADDRESS PAIRING APPARATUS FOR A CONTROL STORE OF A DATA PROCESSING SYSTEM

David E. Cushing, Chelmsford, and Philip E. Stanley, Westboro, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 15, 1980, Ser. No. 140,643
Int. Cl.³ G06F *9/26*
U.S. Cl. 364—200 **3 Claims**



1. In a data processing system wherein a processor executes a series of addressable microinstructions to control the functions performed by the system and wherein the execution of a microinstruction by the processor generates the address of the next microinstruction to be executed and a next address selection signal having either a first value or a second value, a microinstruction storage and transfer apparatus comprising:

a microinstruction output register;

a control store comprising:

a first memory for storing microinstructions in a first plurality of storage locations, said first memory being addressed by said microinstruction addresses generated by said processor, said first memory for selectively outputting from a first output terminal microinstructions stored in said first plurality of storage locations responsive to said addresses generated by said processor and having a first output enable terminal for controlling the outputting of a said addressed microinstruction from said first output terminal;

a second memory for storing microinstructions in a second plurality of storage locations, said second memory normally being addressed by said microinstruction addresses generated by said processor concurrently with said addressing of said first memory, said second memory for selectively outputting from a second output terminal mi-

croinstructions stored in said second plurality of storage locations responsive to said addresses generated by said processor and said second memory having a second output enable terminal for controlling the outputting of said addressed microinstructions from said second output terminal;

means for coupling said outputs of said first memory and said second memory to said microinstruction output register; and

means for concurrently supplying said next address selection signal to said first output enable terminal and said second enable terminal to enable said first memory to output said addressed microinstructions when said next address selection signal has said first value and to enable said second memory to output said addressed microinstructions when said next address selection signal has said second value.

4,348,725

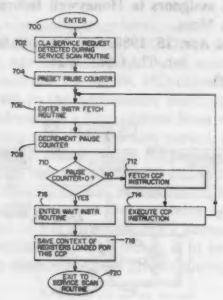
COMMUNICATION LINE SERVICE INTERRUPT TECHNIQUE FOR A COMMUNICATIONS PROCESSING SYSTEM

Robert J. Farrell, Wakefield, Mass.; Kenneth T. Coit, Milford, N.H.; John H. Vernon, Milford, Mass.; Kin C. Yu, Burlington, Mass.; Robert E. Huettner, Acton, Mass., and John P. Grandmaison, Hampton, N.H., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 19, 1977, Ser. No. 760,772

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—300 **15 Claims**



1. In a data processing system including a communications processor coupled to transfer information between a plurality of communication channels and a main memory included in said system, processing means being included in said processor for executing a plurality of information transfer routines in response to information transfer service requests from sources coupled to said communication channels, each routine including a plurality of instructions adapted to control the transfer of said information, a machine implemented process in which said processing means is controlled by stored microprogram instructions to perform the method steps of:

A. scanning a plurality of said sources to determine whether any of said sources is requesting servicing;

B. presetting register counting means included in said processing means to indicate a given value in response to a determination that a first of said sources is requesting that servicing be performed through operation of one of said routines;

C. changing said given value each time the fetching of an instruction from said routines is called for to service said first source;

D. determining whether said register counting means has been changed to indicate a predetermined value;

E. executing said called for instruction and repeating said steps of changing, determining, and executing as long as said predetermined value is not indicated; and

F. reentering said step of scanning if said predetermined value is indicated, thereby temporarily suspending the servicing of said first source and enabling the servicing of another source which may be requesting servicing.

4,348,726

METHOD OF CONTROLLING AUTOMOBILE EQUIPMENT AND CONTROL APPARATUS

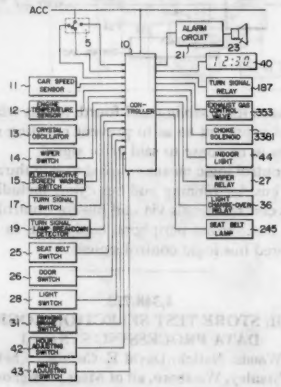
Osamu Igarashi, Katsuta; Masaru Kugo, Ogawamura, and Shizuhisa Watanabe, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,732

Claims priority, application Japan, Apr. 4, 1979, 54/39788; Jul. 27, 1979, 54/94954; Jul. 27, 1979, 54/94985

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—424 **9 Claims**



1. A method of operating a processor-controlled system, through which the operation of automotive equipment is controlled in accordance with the state of operation of the automobile for which said automotive equipment is provided, comprising the steps of:

(a) monitoring the operational state of said automobile and coupling signals representative thereof to said processor; and

(b) periodically interrupting said monitoring step (a) and causing said processor to control the operation of selected ones of said automotive equipment during respective interruption control intervals, the selection of said ones of said automotive equipment occurring at times corresponding to preselected numbers of successive occurrences of the periodic interruption of step (a).

4,348,727

AIR-FUEL RATIO CONTROL APPARATUS

Akio Kobayashi; Takehiro Kikuchi, both of Kariya; Toshio Kondo, Anjo, and Masahiko Tajima, Takahama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 4, 1980, Ser. No. 109,516

Claims priority, application Japan, Jan. 13, 1979, 54-3322

Int. Cl.³ G06F *15/20;* **F02D** *5/00;* **F02B** *3/12*

U.S. Cl. 364—431.06 **7 Claims**

4. An apparatus for controlling the supply of fuel to a combustion engine comprising:

intake sensor means for sensing an intake condition of said combustion engine;

means for generating a signal related to a rotational speed of said combustion engine;

means for generating a ratio signal corresponding to the

relation between an air-fuel ratio in a mixture supplied to said combustion engine and a predetermined ratio;

read only memory means for storing a control program;

read/write memory means having a plurality of memory locations assigned in relation to at least intake conditions of said engine;

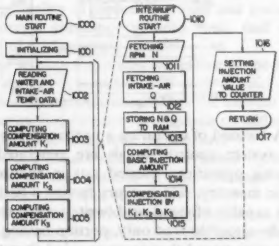
processor means for receiving said sensed intake condition, rotational speed and ratio signal and for:

generating a first value indicative of a basic amount of fuel to be supplied to said engine, said first value being determined from at least said sensed intake condition and said rotational speed,

generating a second value for correcting said first value when a closed loop fuel control is effected in response to said ratio signal, said second value being increased or decreased at predetermined intervals in relation to the magnitude of said ratio signal relative to a reference value indicative of a stoichiometric air-fuel ratio,

addressing one of said plurality of memory locations of said read/write memory means related to at least said sensed intake condition to read one of a plurality of third values stored therein,

generating a new third value at every predetermined interval by increasing or decreasing said one of third valves in relation to the magnitude of said second value relative to a reference value indicative of no correction of said first value and writing said new third value as said one of said third values in said one of said plurality of memory locations, and



generating a fourth value indicative of the required amount of fuel to be supplied to said engine, said fourth value being determined by correcting said first value by said second and third values when said closed loop fuel control is effected and by correcting said first value by said third value when an open loop fuel control is effected; and

fuel supply means for supplying fuel to said combustion engine by the amount of fuel determined by said fourth value.

7. A method for controlling the supply of fuel to a combustion engine comprising the steps of:

generating an intake signal related to an intake condition of said combustion engine;

generating a speed signal related to the rotational speed of said combustion engine;

generating a ratio signal related to the relation between an air-fuel ratio in a mixture supplied to said combustion engine and a predetermined ratio;

determining a first value indicative of a basic amount of fuel to be supplied to said engine, said first value being determined from at least said intake signal and said speed signal;

determining a second value for correcting said first value when a closed loop fuel control is effected in response to said ratio signal, said second value being increased or decreased at predetermined intervals in relation to the magnitude of said ratio signal relative to a predetermined reference value indicative of a stoichiometric air-fuel ratio;

addressing one of a plurality of memory locations of a read/write memory means related to at least said intake signal to read one of a plurality of third values stored therein;

incrementally changing said one of a plurality of third values at predetermined intervals in relation to the magnitude of said second value relative to a predetermined reference value indicative of no correction of said first value;

storing said incrementally changed third value as one of said third values in said one of said plurality of memory locations;

determining a fourth value indicative of the required amount of fuel to be supplied to said engine, said forth value being determined by correcting said first value by said second and third values when said closed loop fuel control is effected and by correcting said first value by said third value when an open loop fuel control is effected; and

supplying fuel to said combustion engine by the amount of fuel determined by said fourth value.

4,348,728

AIR-FUEL RATIO CONTROLLING METHOD AND APPARATUS THEREFOR

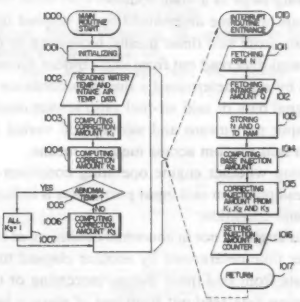
Yasuo Sagisaka, Kariya; Toshio Kondo, Anjo, and Masahiko Tajima, Takahama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 11, 1980, Ser. No. 158,636

Claims priority, application Japan, Jun. 19, 1979, 54-77079

Int. Cl.[3] **G06F** *15/20;* **F02D** *5/00;* **F02B** *3/12*

U.S. Cl. 364—431.06 **7 Claims**



1. A method of controlling the air-fuel ratio of a mixture to be supplied to an internal combustion engine comprising the steps of:

monitoring at least one operating condition of said engine to determine if said at least one operating condition is abnormal;

storing in a first storage location of memory means integrated data read out from said first storage location and integrated in accordance with an output signal of an air-fuel ratio sensor for sensing the air-fuel ratio from the composition of exhaust gases therefrom;

storing in one of a plurality of second storage locations of said memory means engine condition correction data read out from said one of second storage locations in accordance with then existing operating conditions of said engine and corrected in accordance with said stored integrated data;

determining a basic mixture air-fuel ratio control amount in accordance with said engine operating conditions and correcting said basic air-fuel ratio control amount in accordance with said integrated data and said corrected engine condition correction data; and

resetting all of the engine condition correction data stored in said second storage locations of said memory means to a predetermined value when said at least one engine condition is abnormal.

7. An apparatus for controlling the air-fuel ratio of a mixture to be supplied to an internal combustion engine comprising:

sensor means for sensing various operating conditions of said engine, said sensor means including an air-fuel ratio sensor for sensing the air-fuel ratio from the composition of exhaust gases therefrom;

input port means connected to said sensor means to receive therefrom data indicative of operating conditions of said engine;

timer means for measuring an elapsed time interval;

interrupt control means for generating an interrupt request signal;

random access memory means at least part of which functions as a nonvolatile memory;

read-only memory means storing a program and constants;

a presettable counter;

power amplifier means connected to said presettable counter to drive fuel injection valve means for an interval of time corresponding to the content of said counter; and

a microprocessor connected to said input port means, said timer means, said interrupt control means, said random access memory means, said read-only memory means and said presettable counter to respond to starting of said engine to initialize said random access memory means in accordance with said program stored in said read-only memory means and execute said program comprising the following steps as a main routine:

at intervals of a time determined by an elapsed time indicative data from said timer means, increasing or decreasing integrated data read out from said random access memory means by a predetermined value in accordance with output signal data of said air-fuel ratio sensor read out from said input port means and storing said varied integrated data in said random access memory means;

determining whether engine operating condition indicative data read out from said input port means is indicative of an abnormal condition;

when said engine is not in abnormal condition, at intervals of another time determined by another elapsed time indicative data from said timer means, increasing or decreasing correction data read out from one of storage locations of said nonvolatile memory part determined by said engine operation condition indicative data by a predetermined value in accordance with the value of said varied integrated data and storing said varied correction data in said one of storage locations of said nonvolatile memory part;

when said engine is in abnormal condition, resetting all the correction data stored in said storage locations of said nonvolatile memory part to a predetermined value;

said microprocessor being responsive to said interrupt request signal from said interrupt control means to execute as an interrupt handling routine the following steps of said program in said read-only memory means;

reading said engine operating condition indicative data from said input port means and storing the same in said random access memory means;

computing a base fuel injection amount in accordance with said engine operating condition indicative data stored in said random access memory means;

correcting said computed base fuel injection amount in accordance with said varied integrated data and said varied correction data stored in said random access memory means; and setting a value corresponding to said corrected fuel injection amount in said presettable counter.

4,348,729

ENGINE CONTROL SYSTEM INCLUDING NON-VOLATILE MEMORY AND CORRECTION DATA TRANSFER METHOD

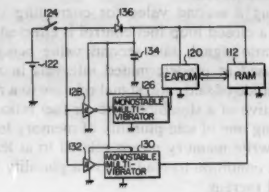
Takao Sasayama, Hitachi, and Seiji Suda, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

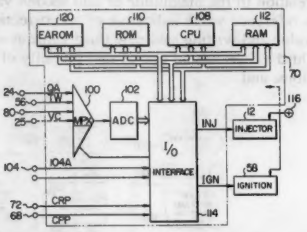
Filed Apr. 11, 1980, Ser. No. 139,550

Claims priority, application Japan, Apr. 13, 1979, 54-44392

Int. Cl.[3] G06F *15/20*; G11C *7/00, 9/00*

U.S. Cl. 364—431.12 **35 Claims**





25. A method of operating a processor-controlled system in which system control signals are generated in response to processing operations carried out in accordance with data stored in memory, said memory having a first, random access, portion capable of rapid read/write access and a second, electronically alterable read only, portion having the capability of holding data stored therein or coupled thereto irrespective of the application of operational energy thereto, comprising the steps of:

(a) successively storing data to be accessed for system operation in said first portion of said memory during a first prescribed condition of operation of said system;

(b) successively causing selected data stored in said first portion of said memory to be transferred to said second portion of said memory in response to the occurrence of a second prescribed condition of operation of said system, the time between successive occurrences of said second prescirbed condition being greater than the time between successive occurrences of said first prescribed condition; and

(c) reading out data in accordance with which said system control signals are generated exclusively from said first portion of said memory.

30. For use in a processor-controlled system in which system control signals are generated in response to processing operations carried out in accordance with predetermined information, an information storage and retrieval system comprising:

memory means having a first, random access, portion capable of rapid read/write access and a second, electronically alterable read only, portion having the capability of holding information stored therein or coupled thereto irrespective of the application of operational energy thereto; and

means, coupled to said memory, for causing information to be stored in said first portion of said memory during a first prescribed condition of operation of said system, and for causing selected information stored in said first portion of

said memory to be transferred to said second portion of said memory in response to the occurrence of a second prescribed condition of operation of said system corresponding to a prescribed historical state of operation of said system.

4,348,730

SYSTEM FOR METERING ELECTRICAL ENERGY WITH REMOTE TIME SIGNAL CORRELATION

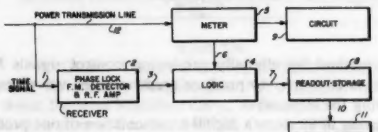
Paul J. Emerson, Scottsdale, and Walter P. Hedges, Laveen, both of Ariz., assignors to Cyborex Laboratories, Inc., Phoenix, Ariz.

Continuation of Ser. No. 914,029, Jun. 9, 1978, Pat. No. 4,216,527. This application May 30, 1980, Ser. No. 154,774

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.³ G01R *21/06*; G06F *15/20*

U.S. Cl. 364—483 **6 Claims**



1. In a system for metering the electrical energy consumption in each of a plurality of separate circuits and correlating said electrical energy consumption with time, said system including in each of said separate circuits

meter means for sensing a quantity indicative of the amount of electrical energy consumption in each of said circuits and for generating signals indicative of the amount of said electrical energy consumption in response to said sensing,

timing means for generating time signals, and

logic means in each of said circuits for correlating said signals indicative of said amount of said electrical energy consumption and said time signals,

the improvements comprising receiver-logic means in each of said plurality of separate circuits for receiving a common time signal generated at and transmitted from a location remote from said plurality of separate circuits and for separately correlating said time signals with said signals indicative of said amount of said electrical energy consumption for each of said circuits to provide data correlating said time signals with said signals indicative of said amount of electrical energy consumption for each of said separate circuits.

4,348,731

AUTOMATIC WORKING APPARATUS AND METHOD OF CONTROLLING THE SAME

Takashi Kogawa, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

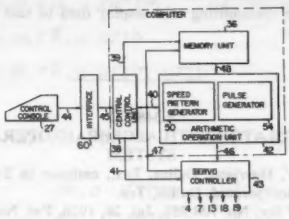
Filed Apr. 18, 1979, Ser. No. 31,301

Claims priority, application Japan, Mar. 5, 1979, 54-24514

Int. Cl.³ G06F *15/46*; G05B *15/00*

U.S. Cl. 364—513 **11 Claims**

1. An automatic working apparatus comprising a route-controlled object to be controlled in respect of a path along which said object is moved, a base portion, drive means including a plurality of actuator means provided between said route-controlled object and said base portion and capable of moving said route-controlled object sequentially to a plurality of positions in different directions, arithmetical operation control means for arithmetically determining bend angles at bend points to be traced sequentially by said route-controlled object and producing output signals for changing the moving speed of said route controlled object at the time when said route-controlled object passes by said bend point as a function of said bend angle in such manner that said moving speed of said route-controlled object is correspondingly decreased for a relatively greater value of said bend angle, said arithmetical operation control means calculating the bend angle at each bend point and amount of change for respective actuator means to move the route-controlled object to the bend point, said arithmetical operation control means producing an output signal for changing the moving speed of respective actuator means in accordance with the calculated bend angle, the moving speed being the speed at the time when the route-controlled object passes the bend angle, and servo control means for operating respective actuator means of said drive means in response to said output signals from said arithmetical operation control means.



4,348,732

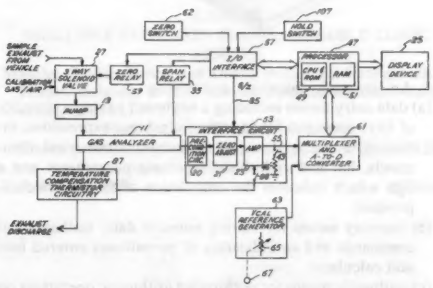
METHOD AND APPARATUS FOR ENGINE EXHAUST ANALYZER

Keith A. Kreft, Mount Prospect, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.

Filed Jan. 29, 1980, Ser. No. 116,406

Int. Cl.³ G01N *1/22*

U.S. Cl. 364—571 **19 Claims**



1. A gas analyzation system for analyzing an unknown gas, comprising:

gas analyzing means for receiving an unknown gas to be analyzed and generating an electrical signal output representative of the analyzation of the unknown gas;

span reference means selectively actuable for simulating a reference gas, said gas analyzer means cooperating with said span reference means for generating a reference signal output representative of said reference gas in response to actuation of said span reference means;

display means responsive to display data for visually displaying an indication of gas analyzation;

data entry means for inputing a sole scaler data, said data entry means being controllable for selectively changing said sole scaler data; and

processing means including memory,

(i) for receiving said electrical signal output representative of the analyzation of the unknown gas and converting the same to gas data,

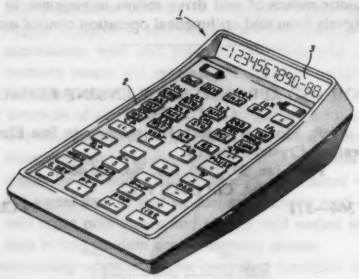
(ii) for actuating said span reference means for generating a reference signal output, for receiving said reference signal output and converting the same to reference data,
(iii) for reading said sole scalar data,
(iv) for generating display data from said gas data by adjusting said gas data in view of said reference data and said sole scalar data, and
(v) for transmitting said display data to said display device.

4,348,733

CALCULATOR WITH ALGEBRAIC OPERATING SYSTEM

Herman W. Harrison, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 708,958, Jul. 26, 1976, Pat. No. 4,208,720. This application Nov. 19, 1979, Ser. No. 95,838
The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.
Int. Cl.³ G06F *7/38, 15/02*
U.S. Cl. 364—709 **8 Claims**



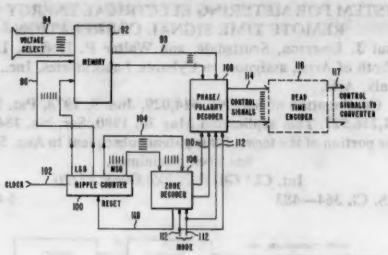
1. An electronic calculator comprising:
(a) data entry means including a keyboard having a plurality of keys arranged for inputting algebraic expressions, including numeric data, hierarchical mathematical commands, left and right-hand algebraic parentheses and a sign which indicates the completion of an algebraic expression;
(b) memory means for storing numeric data, mathematical commands and an indication of parentheses entered into said calculator;
(c) arithmetic means for performing arithmetic operations on the entered numeric data in accordance with the entered mathematical commands associated therewith;
(d) logic means for controlling said arithmetic means to perform arithmetic operations on numeric data within each pair of parentheses according to fixed hierarchy so that said arithmetic means performs higher order mathematical commands before lower order mathematical commands within the same respective pair of parentheses, said logic means being responsive to entry of said sign which indicates the completion of an algebraic expression for controlling said arithmetic means to perform arithmetic operations on all previously stored numeric data according to the stored mathematical commands associated therewith, said logic means being further responsive to the entry of said sign for supplying any missing right-hand parentheses; and
(e) display means for displaying numeric data entered into said calculator via said keyboard entry means and for displaying the results of said arithmetic operations performed on said numeric data.

4,348,734

CONVERTER BY STORED SWITCHING PATTERN

John J. Dougherty, Fanwood, N.J., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Jul. 10, 1980, Ser. No. 168,460
Int. Cl.³ G06F *15/34*
U.S. Cl. 364—721 **21 Claims**



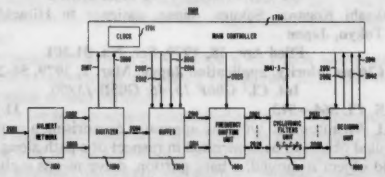
1. A method for digitally producing control signals for operating a converter to produce predetermined waveforms, comprising the steps of:
(1) storing in memory a digital representation of one predetermined segment of each one of a plurality of waveforms desired for selective reproduction, each segment being divided into a fixed number of equally spaced switching angles, said digital representation being the switching pattern for operating said converter to synthesize said predetermined segment of a selected waveform;
(2) selecting from memory at least a desired one of the switching patterns for said predetermined segments;
(3) decoding the switching patterns(s) for digitally arranging the phase and polarity of each segment, respectively, to correspond to a desired portion of the respective waveform(s) being reproduced;
(4) repeating steps (2) and (3) as required for assembling digital representations of the entire switching pattern for a desired waveform(s) for driving said converter to synthesize the desired waveform(s).

4,348,735

CYCLOTOMIC TONE DETECTOR AND LOCATOR

David Hertz, Akko, Israel; Robert P. Kurshan, New York, N.Y., and David Malah, Kiryat-Bialik, Israel, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 23, 1980, Ser. No. 162,262
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 **7 Claims**



1. A frequency measuring system for detecting and estimating the frequency of an analog tone
characterized by
means (1100) for receiving and transforming said tone to obtain both a real tone corresponding to a phase-shifted version of said tone and an imaginary tone corresponding to the quadrature of said real tone;
means (1200), responsive to said means for transforming, for

sampling said real tone and said imaginary tone to provide a sequence of real and imaginary word pairs;

buffer means (**1300**), coupled to said means for sampling, for storing a plurality of said word pairs;

modulus-one means (**1400**), connected to said buffer means, for generating frequency-shifted real words and imaginary words from selected ones of said word pairs;

digital filter means (**1500**), responsive to said modulus-one means and said buffer means, comprising two pairs of first-order cyclotomic filters (**1501,1502**) and two pairs of second-order cyclotomic filters (**1503,1504**), with one filter from each of said pairs arranged to process real words and the other arranged to process imaginary words, each of said pairs producing a real output and an imaginary output; and

decision means (**1600**), responsive to said filter means, for processing said real output and said imaginary output of each of said pairs of filters and indicating the appropriate frequency subband containing said tone based on predetermined relationships involving each said output.

4,348,736

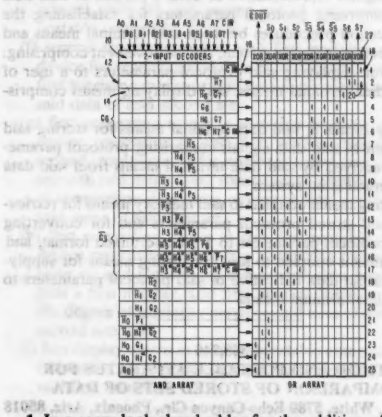
PROGRAMMABLE LOGIC ARRAY ADDER

Arnold Weinberger, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 948,720, Oct. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 866,688, Jan. 3, 1978, abandoned. This application Jul. 22, 1980, Ser. No. 171,215

Int. Cl.³ G06F *7/50*

U.S. Cl. 364—787 **13 Claims**



1. In a carry look ahead adder for the addition of two multi digit numbers $A_0, A_1 \ldots A_{n-1}$ and $B_0, B_1 \ldots B_{n-1}$ (0 to n-1 high-to-low order) and an input carry digit C_{in} to generate a multi digit binary sum $S_0, S_1 \ldots S_{n-1}$ and a carry out digit C_{out} using programmable logic arrays each such programmable logic array including a plurality of multi bit input decoders feeding signals to a product term generating array which in turn feeds signals to a sum of product term generating array that supplies signals to Exclusive-OR circuits providing an Exclusive-OR function of two inputs, the improvement comprising:

means feeding like order digits A_i, B_i of the two multi digit numbers to the same multi bit input decoder; and

circuit means in the product term and sum of product term generating arrays to generate a sum digit S_i as the output of one of the Exclusive-OR circuits in accordance with the following formula:

$$S_i = (H_i \, V \, \overline{G}_{i+1}) \cdot \overline{(GH)^{i+3}_{i+2}}$$

-continued

$$+ (H_i \, V \, \overline{G}_{i+1}) \cdot (H^{i+3}_{i+2}{}^{**}) \cdot \overline{(GH)^{i+5}_{i+4}}$$

$$+ (H_i \, V \, \overline{G}_{i+1}) \cdot (H^{i+3}_{i+2}{}^{**}) \cdot \ldots \cdot \overline{(GH)^{j-2}_{j-3}}$$

$$+ (H_i \, V \, \overline{G}_{i+1}) \cdot (H^{i+3}_{i+2}{}^{**}) \cdot \ldots \cdot (H^{j-2}_{j-3}{}^{**}) \cdot (\overline{G}_{j-1})$$

$$+ (H_i \, V \, \overline{P}_{i+1}) \cdot (G^{i+3}_{i+2})$$

$$+ (H_i \, V \, \overline{P}_{i+1}) \cdot (H^{i+3}_{i+2}{}^{*}) \cdot (G^{i+5}_{i+4})$$

$$+ (H_i \, V \, \overline{P}_{i+1}) \cdot (H^{i+3}_{i+2}{}^{*}) \cdot \ldots \cdot (H^{j-2}_{j-3}{}^{*}) \cdot (G^{}_{j-1})$$

V

$$(\overline{H}_{i+1}) \cdot (H^{i+3}_{i+2}{}^{**}) \cdot \ldots \cdot (H^{j-2}_{j-3}{}^{**}) \cdot (\overline{G}_{j-1})$$

$$+ (H_{i+2} \, V \, \overline{G}_{i+3}) \cdot (H^{i+5}_{i+4}{}^{**}) \cdot \ldots \cdot (H^{j-2}_{j-3}{}^{**}) \cdot (\overline{G}_{j-1})$$

$$+ (\overline{H}_{j-4}) \cdot (H^{j-2}_{j-3}{}^{**}) \cdot (\overline{G}_{j-1})$$

$$+ (H_{j-3} \, V \, \overline{G}_{j-2}) \cdot (\overline{G}_{j-1}) + (\overline{H}_{j-2}) \cdot (\overline{G}_{j-1}) + (H_{j-1} \, V \, \overline{G}_j)$$

$$+ (\overline{H}_j) + \overline{C}_{j+1}$$

where $G_i = A_i \cdot B_i$ $\overline{G}_i = \overline{A}_i + \overline{B}_i$

$P_i = A_i + B_i$ $\overline{P}_i = \overline{A}_i \cdot \overline{B}_i$

$H_i = A_i \, V \, B_i$ $\overline{H}_i = \overline{A_i \, V \, B_i}$

i = ith bit position

j = bit position of lower order than i.

H^* is one of $A \, V \, B$ and $\overline{A} + \overline{B}$

H^{**} is one of $A \, V \, B$ and $\overline{A} + \overline{B}$

4,348,737

MULTIPLE-FUNCTION PROGRAMMABLE LOGIC ARRAYS

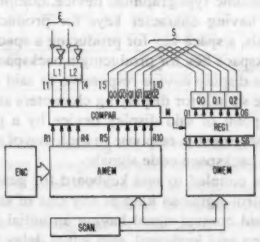
Maurice Cukier, Vence, and Daniel Sellier, La Gaude, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,146

Claims priority, application France, Oct. 31, 1978, 78 31281

Int. Cl.³ H03K *19/00, 19/08*

U.S. Cl. 364—900 **6 Claims**



1. A programmable logic array comprising:

a. an input terminal;

b. an output terminal;

c. an input register connected to the input terminal;

d. an output register connected to the output terminal;

e. a first random access memory adapted to receive a prescribed data pattern;

f. a second random access memory adapted to receive a prescribed data pattern complimentary to the data pattern of the first randon access memory;

g. a buffer register having an input connected to the output of the second random access memory and an output connected to the input of the output register;

h. means for resetting the buffer register;

i. a comparator having a first input connected to the output of the first random access memory and a second input connected to the output of the input register and the output of the output register, the comparator output controlling the transfer of the buffer register contents; and

j. addressing means connected to the first random access memory and the second random access memory for sequentially and cyclically presenting segments of the first random access memory data pattern to the comparator and segments of the second random access memory data pattern complimentary to the data segment of the first memory to the buffer register such that when the inputs to the comparator satisfy a prescribed condition, the comparator output causes transfer of the buffer register contents.

4,348,738

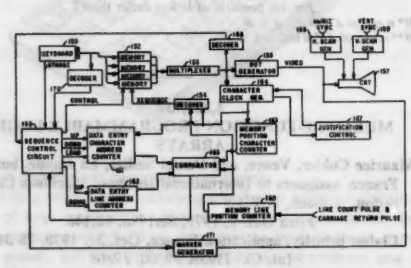
ELECTRONIC TYPOGRAPHICAL DISPLAY DEVICE WITH JUSTIFICATION FEATURE

William R. Grier, New Vernon; Francis H. Shepard, Jr., Summit, and Arthur L. Arledge, Basking Ridge, all of N.J., assignors to R & I Patent Corporation, Morristown, N.J.

Division of Ser. No. 820,579, Aug. 1, 1977, which is a division of Ser. No. 622,172, Oct. 14, 1975, Pat. No. 4,054,948. This application Nov. 15, 1979, Ser. No. 94,652

Int. Cl.³ G06F *5/00, 5/02*

U.S. Cl. 364—900 **1 Claim**



1. An electronic typographical device, comprising:

a keyboard having character keys for producing character code signals, a space key for producing a space code signal, and a backspace key for producing a backspace code signal;

an electronic display device responsive to said character and space code signals for displaying characters and for moving the print point of said display device by a predetermined distance increment in response to each one of said character, space and backspace code signals;

timing means coupled to said keyboard for generating a keyboard control signal so long as any one of said keys is depressed, said control signal having an initial delay interval for disabling said keyboard, said initial delay interval being greater than a maximum preselected time that an operator would normally be expected to hold a key depressed, said control signal initial delay interval being followed by a series of keyboard enabling and disabling pulses at a rapid rate, to cause said keyboard to produce a series of code signals corresponding to said one key, when said any one key is depressed for a time interval greater than said maximum preselected time,

whereby said display device responds to said code signals by displaying a corresponding series of characters or spaces as though said any one key had been repeatedly depressed.

4,348,739

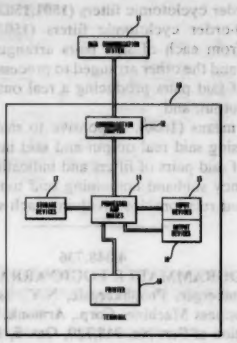
TERMINAL PROVIDING COMMUNICATION SYSTEM INFORMATION OUTPUT

Randall L. Deaver, Boulder; Thomas J. Freund, Longmont, and Patrick J. Gerstle, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 12, 1980, Ser. No. 120,941

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—900 **3 Claims**



1. In a data communication system of the type wherein a data terminal means can be coupled via a data link means for carrying signals representative of data, a portion of said data signals comprising protocol parameters for establishing the communication procedures between said terminal means and said data communication system, the improvement comprising:

means for displaying said protocol parameters to a user of said data terminal means, said displaying means comprising

memory means in said data terminal means for storing said portion of said data signals comprising protocol parameters received by said data terminal means from said data communication system;

converting means coupled to said memory means for retrieving said stored protocol parameters and for converting said protocol parameters to a predetermined format; and

output means coupled to said converting means for supplying output data indicative of said protocol parameters to said data terminal means.

4,348,740

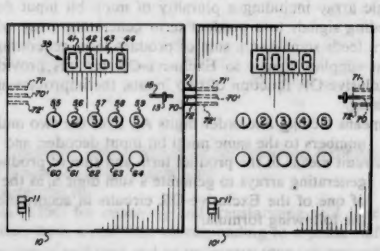
METHOD AND PORTABLE APPARATUS FOR COMPARISON OF STORED SETS OF DATA

Edward A. White, 5780 Echo Canyon Cir., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 893,342, Apr. 4, 1978, abandoned. This application Jun. 13, 1980, Ser. No. 159,206

Int. Cl.³ G06F *7/02, 15/16, 15/336*

U.S. Cl. 364—900 **6 Claims**



1. A first portable computing device for comparing a first set

of data stored in said first portable computing device with a second set of data stored in a second computing device to which said first portable computing device can be temporarily coupled, said first portable computing device comprising in combination:

(a) coupling means for temporarily coupling said first portable computing device to said second computing device to effect transmission of data of said first set from said first portable computing device to said second computing device and to effect transmission of data from said second set from said second computing device to said first portable computing device, said first set of data including a plurality of items of information about a first subject, said second set of data including a plurality of items of information which correspond with said plurality of items of said first set, wherein said items of said first set are to be respectively compared with said corresponding items of said second set;

(b) first storage means in said first portable computing device for storing said first set of data, said first storage means being capable of storing said first set of data with only a negligable amount of dissipation of power supplied to said first storage means;

(c) first transmitting means connected to said coupling means for transmitting data of said first set from said portable computing device to said second computing device via said coupling means;

(d) first receiving means responsive to said coupling means for receiving data of said second set from said second computing device;

(e) data entry means for effecting manual entry of said first set of data into said first storage means and also effecting manual entry of said second set of data into said first portable computing device;

(f) second storage means in said first portable computing device for receiving said data of said second set from said first receiving means or said data entry means and storing said data of said second set;

(g) first comparing means in said first portable computing device responsive to said first storage means and said second storage means for comparing said data of said first set with said data of said second set to produce a plurality of comparison data items corresponding, respectively, to said items of said first set;

(h) first computing means in said first portable computing device responsive to said first comparing means for operating on said plurality of comparison data items to compute a first number, said first number being indicative of the degree of similarity between said data of said first and second sets; and

(i) first display means in said first portable computing device responsive to said first computing means for displaying said first number.

4,348,741

PRIORITY ENCODER

Doyle V. McAlister, Pflugerville; Thomas G. Gunter, Austin; Michael E. Spak, Kyle, and Gene A. Schriber, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 17, 1980, Ser. No. 169,558

Int. Cl.³ G06F *7/00*

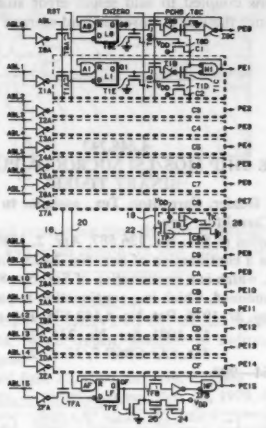
U.S. Cl. 364—900 **15 Claims**

1. A priority encoder register for receiving a plurality of binary input signals and generating output signals in accordance with a prescribed priority sequence, comprising:

a plurality of input means, each coupled to receive one of said binary input signals;

a plurality of output means, each coupled to an associated one of said input means and to adjacent ones of said output means, each for generating an output signal if its associated input means has received an input signal of a first logic level; and

first means coupled to each of said plurality of output means for blocking all but one of said output signals at a time, said one of said output signals being associated with one of said output means of higher priority, each of said output



signals resetting its associated input means to a second logic level to enable another one of said output means of a next lower priority.

4,348,742

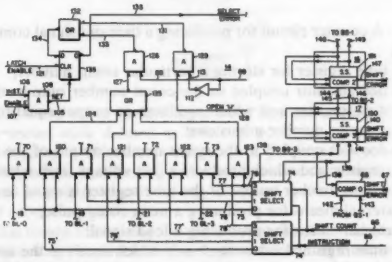
HIGH SPEED BYTE SHIFTER ERROR CHECKING CIRCUITS

Steven M. O'Brien, Norristown, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 23, 1981, Ser. No. 227,859

Int. Cl.³ G06F *11/10*

U.S. Cl. 364—900 **10 Claims**



1. Apparatus for checking the correct operation of a byte shifter of the type having a plurality of input ports connected to individual byte lines of a data bus for supplying bytes of data to the byte shifter, said byte shifter being provided with control means for enabling one of said input ports to supply a selected byte of data from one of said byte lines to a buffer register and for enabling a return byte line for returning said selected byte of data to a different byte line of said data bus, the improvement comprising:

a first shift select means adapted to enable a predetermined one of said input ports of said byte shifter,

a second shift select means being adapted to enable a logic gate indicative of the input port being enabled,

said logic gate having a second input connected to said first shift select means for generating an output when said first and said second shift select means are present at the inputs,

select error storage means coupled to the output of said logic

gating means for storing the signal indicative of proper input port selection in said byte shifter, and

clock means coupled to said select error storage means for reading out the signal stored in said storage means.

4,348,743

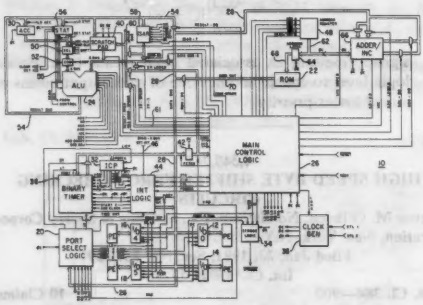
SINGLE CHIP MOS/LSI MICROCOMPUTER WITH BINARY TIMER

Harold W. Dozier, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 136,587, Apr. 2, 1980, abandoned, which is a continuation of Ser. No. 2,425, Jan. 10, 1979, abandoned, which is a continuation of Ser. No. 815,932, Jul. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 726,579, Sep. 27, 1976, Pat. No. 4,142,176. This application Feb. 13, 1981, Ser. No. 234,174

Int. Cl.³ G06F *7/38, 1/00*

U.S. Cl. 364—900 **10 Claims**



1. A counter circuit for producing a time-out signal comprising:

a time register for storing a particular count number;

a decrementor coupled to the count number output of the time register and which produces an output equal to the counter number minus one;

a decoder coupled to the count number output of the time register and which produces a first voltage level when the count number output of the time register is equal to one;

external means for producing a main count pulse;

external means for producing a load signal;

a time register load control unit which receives the output signal from the decoder, the main count pulse and the load signal and which produces a count signal when the main count pulse occurs, the decoder output is not at the first voltage level and the load signal is not occurring, and which produces a reload signal when the main count pulse occurs and the decoder output is at the first voltage level, or when the load signal occurs;

first gating means for transferring the output of the decrementor into the time register when the count signal is produced by the time register load control unit;

a modulo-N data storage means for storing an initial count number N for the time register, N being a positive integer;

second gating means for transferring the initial count number N from the modulo-N data storage means to the time register when the reload signal is produced by the time register load control unit; and

a third gating means for producing at time out signal when the decoder output is at a first voltage level, the main count pulse occurs and the load signal is not occurring.

4,348,744

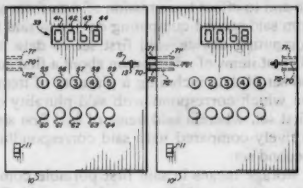
METHOD AND PORTABLE APPARATUS FOR COMPARISON OF STORED SETS OF DATA

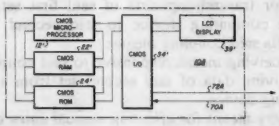
Edward A. White, 5780 Echo Canyon Cir., Phoenix, Ariz. 85018

Continuation of Ser. No. 893,342, Apr. 4, 1978, abandoned. This application Apr. 29, 1981, Ser. No. 258,767

Int. Cl.³ G06F *15/336, 7/20, 15/16, 15/44*

U.S. Cl. 364—900 **35 Claims**





1. A system for comparing first and second sets of data, said system comprising:

(a) first and second portable computing devices;

(b) first storage means in said first computing device for storing said first set of data, said first set of data including a plurality of items of information, said second set of data including items of information with which corresponding items of information of said first set of data are to be respectively compared, and second storage means in said second computing device for storing said second set of data, said plurality of items of said first set corresponding respectively on an item-by-item basis to said plurality of items of said second set;

(c) switch means in one of said first and second portable computing devices for producing a first signal to initiate data transmission;

(d) first transmitting means in said first computing device for transmitting data of said first set from said first computing device to said second computing device in response to said first signal;

(e) data entry means for entering said first set of data into said first storage means while said first computing device is not coupled to said second computing device and before said producing of said first signal to initiate said transmitting data of said first set;

(f) first receiving means in said second computing device for receiving said data of said first set transmitted from said first computing device;

(g) first comparing means in said second computing device responsive to said second storage means and said first receiving means for comparing said items of said data of said second set stored in said second storage means with said corresponding items of said received data of said first set to produce a plurality of comparison data items corresponding to respective ones of said items of said first set;

(h) computing means in said second computing device responsive to said first comparing means for operating on said plurality of comparison data items to effect computing of a first number, said first number being indicative of the degree of similarity between all of said data of said first and second sets; and

(i) first display means in said second computing device responsive to said first comparing means for displaying

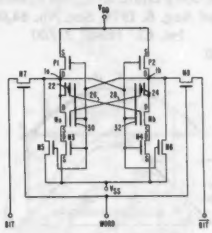
information representative of said first number to provide an indication of the compatability of things or persons represented by said first and second sets of data, respectively.

4,348,745

NON-VOLATILE RANDOM ACCESS MEMORY HAVING NON-INVERTED STORAGE

Lawrence S. Schmitz, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 27, 1980, Ser. No. 200,758
Int. Cl.³ G11C *11/40, 13/00*
U.S. Cl. 365—154 **5 Claims**



3. In a latch having two branches, each branch comprising a source-drain channel with a series load connected thereto to define a node therebetween and a voltage source connected across each of the branches, the channel of at least one of said branches having an associated electron tunneling region, a floating gate overlying said tunneling region and overlying the source-drain channel of the other of said branches, and a control gate overlying said tunnelling region and said floating gate, a method for performing nonvolatile storage of a logic bit comprising:

holding one of said nodes at a voltage level corresponding to the logic bit while holding the other node at a voltage level corresponding to the complement of said bit so that one of said channels conducts charge while the other does not; and

changing the resistance to charge flow in said other channel by increasing the magnitude of the voltage source connected across said branches to cause electrons to tunnel across said tunneling region so as to change the amount of charge stored on said floating gate in accordance with the voltage levels of said nodes.

4,348,746

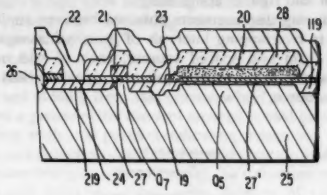
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A PLURALITY OF INSULATED GATE FIELD EFFECT TRANSISTORS

Hidekazu Okabayashi; Kohei Higuchi, and Tadatoshi Nozaki, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 135,032
Claims priority, application Japan, Mar. 30, 1979, 54-39171
Int. Cl.³ G11C *11/40;* H01L *27/04*
U.S. Cl. 365—182 **16 Claims**

1. A semiconductor integrated circuit device comprising:

a first insulated gate field effect transistor including source and drain regions of N conductivity type formed along a major surface of a semiconductor substrate of P conductivity type, a channel region positioned between said source and drain regions, a gate insulator film formed on said channel region, and a gate electrode made of a high-melting-point metal and formed on said gate insulator film; and a second insulated gate field effect transistor including a gate insulator film formed on said major surface of said substrate and a gate elecgtrode made of a semi-conductor material, formed on said gate insulator film of said second



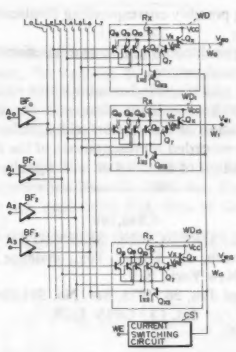
transistor and contacting directly with a surface of one of said source and drain regions of said first transistor.

4,348,747

SYSTEM FOR DRIVING BIPOLAR RAM

Yukio Takahashi, Shiga, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 22, 1980, Ser. No. 123,643
Claims priority, application Japan, Feb. 28, 1979, 54-23086
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 **37 Claims**



26. A word driver for driving a word line into a selected or non-selected state defined as levels of potential, operatively connected to a reference voltage, to a power supply, to a plurality of bus lines having active and inactive states, and to a current switching circuit having read and write states, said word driver comprising:

a first means for driving the word line at the potential corresponding to said selected state of the word line if and only if all of the bus lines are in an active state; and

a second means for selectively driving the word line, only if any one of the bus lines is in an inactive state, at the potential corresponding to the non-selected state of the word line in accordance with the read or write state of the current switching circuit.

4,348,748

DIPMETER DISPLACEMENT PROCESSING TECHNIQUE

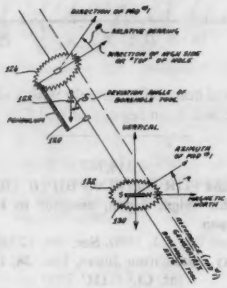
Christian M. J. Clavier, Paris, France; Vincent R. Hepp, Ridgefield, Conn., and Alexis C. Dumestre, Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,998
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—25 **70 Claims**

2. A method of automatically processing with a machine

displacements obtained between geophysical signals derived from sources spaced at different positions to determine and produce recorded representatives of the relative position of the features on said signals, comprising:

(a) producing displacements obtained between similar features in overlapping intervals of geophysical signals derived from said spaced sources, each of said intervals overlapping adjacent intervals on a signal derived from a given source;



(b) combining possibly corresponding displacement between said signals;

(c) classifying each combination as a function of the relative position of said sources;

(d) analyzing said classified combinations to determine the position of the dominant class and the corresponding relative position of features on said signals; and

(e) producing recorded representations of the corresponding relative position of features on said signals.

4,348,749

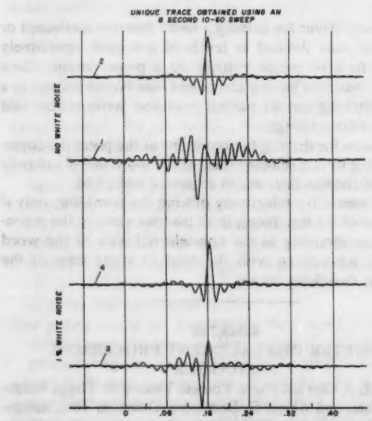
PHASE CORRECTING SEISMIC TRACES

James N. Galbraith, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1975, Ser. No. 591,914

Int. Cl.³ G01V *1/28*

U.S. Cl. 367—46 **13 Claims**



1. An automatic method of processing in an automatic data processing machine signals representing deconvolved seismic traces obtained by applying to the earth seismic energy, the signal pulse of which is known, comprising:

(a) generating a signal representing the minimum phase inverse of said signal pulse;

(b) convolving said signal representing the minimum phase inverse of said signal pulse with said signal pulse to obtain a signal representing a function g(t);

(c) generating a signal representing the time reverse of said signal representing a function g(t) to obtain a signal representing a function h(t); and

(d) convolving said signal representing a function h(t) with said signals representing deconvolved seismic traces to phase correct said deconvolved seismic traces.

4,348,750

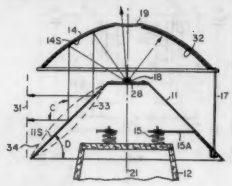
ENERGY CONTROL DEVICE

David R. Schwind, 557 Peralta Ave., San Francisco, Calif. 94110

Filed Aug. 6, 1979, Ser. No. 64,067

Int. Cl.³ H04R *23/00*

U.S. Cl. 367—140 **4 Claims**



1. A radiant energy control device to control dispersion of radiant energy is 360° comprised of:

a first reflector having a concave parabolic reflecting surface symmetrical about an axis which contains the focal point;

a second reflector having an outer reflecting surface which is conical and converges toward the first reflector and which is symmetrical about an extension of said axis and oriented to effect a change of direction of radiant energy between a direction parallel to said axis extension and directions radial to said axis extension, and oriented for the reflection of energy between said first and second reflecting surfaces;

a source of radiant energy positioned on the second reflector and mounted symmetrically along said axis, said source being directional and radiating energy that substantially propagates from said source along straight lines as rays toward the concave reflecting surface of the first reflector for reflection from said first reflector substantially parallel to said axis and onto said second reflector.

4,348,751

ELECTRONIC DEVICE AND METHOD OF FABRICATING THE SAME

Hideki Kosaka, Kodaira; Tsutomu Mimata, Akikawa; Tsuyoshi Shimizu; Hideharu Yamamoto, both of Hinode; Kaoru Itoh, Kodaira, and Yasuhusa Shima, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,923

Claims priority, application Japan, Jun. 20, 1977, 52/72041; Aug. 10, 1977, 52/95020; Aug. 10, 1977, 52/95021; Aug. 10, 1977, 52/95022; Dec. 9, 1977, 52/147084; Dec. 19, 1977, 52/151762; Dec. 19, 1977, 52/151763; Dec. 23, 1977, 52/154442; Dec. 23, 1977, 52/154443; Dec. 23, 1977, 52/154480; Jan. 20, 1978, 53/4365; May 15, 1978, 53/56697

Int. Cl.³ G04C *19/00, 23/02*

U.S. Cl. 368—82 **17 Claims**

1. An electronic device for an electronic watch comprising:

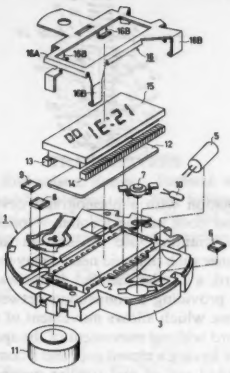
(a) a display device for receiving electric display signals;

(b) a plurality of electronic parts including a semiconductor integrated circuit element for a watch circuit;

(c) an enclosure within which said semiconductor integrated circuit is embedded;

(d) a block having receiving sections, said electronic parts, except for the semiconductor integrated circuit element, being respectively disposed in said receiving sections;

(e) plate-like lead conductors extending in a common plane between said enclosure and said block for electrically interconnecting said electronic parts, said lead conductors each having a first portion embedded in said enclosure and connected to said semiconductor integrated circuit element, a second portion embedded in said block and a third portion exposed between said enclosure and block, said third portion being held at opposite ends by said first and



second portions embedded in the enclosure and block, respectively; and

(f) connection means for electrically connecting said display device to the third portion of selected ones of said lead conductors at upper surfaces of said third portions;

wherein said block has holes at said receiving sections for exposing parts of the second portion of select ones of said lead conductors and said electronic parts disposed in said receiving sectors are electrically connected to upper surfaces of said exposed parts of the second portion of the lead conductors, respectively.

4,348,752

ELECTRONIC WATCH WITH MOVABLE DETECTING MEMBER

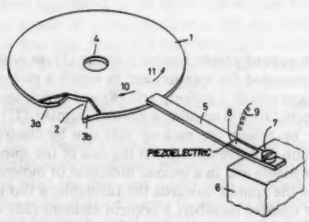
Norberto Perucchi, St. Blaise, Switzerland, assignor to Eta A.G. Ebauches-Fabrik, Grenchen, Switzerland

Filed Jun. 10, 1980, Ser. No. 158,204

Claims priority, application Switzerland, Jun. 28, 1979, 6047/79

Int. Cl.³ G04C *9/00*

U.S. Cl. 368—187 **3 Claims**



1. An electronic watch, comprising:

a frame;

hands;

a gear train for driving said hands, comprising a disk-shaped counterwheel having position-indicating means, comprising a radial slot in said counterwheel, said slot having edges which form projecting elements;

a stepping motor for driving said gear train;

a detection circuit;

a counter;

movable detecting means comprising a resilient blade disposed radially from said counterwheel at a fixed location and a piezoelectric element secured to said blade, cooperating with said position-indicating means and connected to said detection circuit and to said counter, said detecting means being capable of causing the transmission of signals in said detection circuit upon rotation of said counter wheel, said projecting elements being adapted to move said detecting means differently depending upon the direction of rotation of said counterwheel, whereby said signals cause the algebraic counting of the number of revolutions effected by said counterwheel, said blade normally being kept bent by pressing against one or the other of the faces of said counterwheel, said slot being so arranged that when said slot is aligned with said blade, said blade straightens out, then either vibrates and again presses against the same face of said counterwheel or passes to the other face of said counterwheel without vibrating, according to the direction of rotation of said counterwheel.

4,348,753

ELECTRO-MECHANICAL PULSE GENERATOR

Arnold Werner, Nuremberg; Peter Ennen, Allersberg; Josef Nuebauer, Grobschwarzenlohe; Hans Flaig, Schramberg, and Juergen Allgaier, Lauterbach, all of Fed. Rep. of Germany, assignors to Firma D I E H L, Nuremberg, Fed. Rep. of Germany

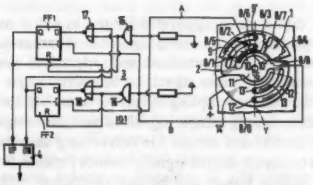
Continuation of Ser. No. 861,444, Dec. 16, 1977, abandoned.

This application May 21, 1980, Ser. No. 152,036

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658105

Int. Cl.³ G04C *9/00;* **G04B** *29/00;* **H03K** *17/56*

U.S. Cl. 368—188 **18 Claims**



1. An electro-mechanical pulse generator for producing electronic pulses for setting or correcting an electronic digital display, comprising:

a first assembly including several pulse-generating components which are arranged substantially at regular intervals within a circular track, concentric with an axle of rotation;

a second assembly, rotatable relative to said first assembly at variable speeds in a desired direction, including several sensing elements which cooperate with the pulse-generating components of said first assembly to actuate pairs of electrical contacts which are spaced relative to one another so that rotation of said first and second assemblies relative to one another causes at least two pairs of electrical contacts to be separately closed to directly produce at least two pulses which are displaced timewise, wherein the frequency of the pulses is proportional to the relative speed between said first and second assemblies and the phase shift of one pulse relative to another is dependent upon the direction of rotation of one of said assemblies relative to the other;

an UP-DOWN counter;

control logic for determining the phase shift between pulses and controlling the forward or backward actuation of said counter in response to the pulses; and

a latching device coupled to said axle of rotation, said latching device maintaining all of said pairs of contacts open when the pulse generator is not actuated; and wherein said pulse-generating components of said first assembly and said sensing elements of said second assembly are angularly offset about said axle of rotation with respect to each other so that said at least two pulses which are directly produced by closure of said two pairs of electrical contacts upon actuation of the pulse generator will partially overlap in at least one direction of relative rotation of the assemblies.

4,348,754

DIGITAL DELAY FOR HIGH QUALITY AUDIO USE

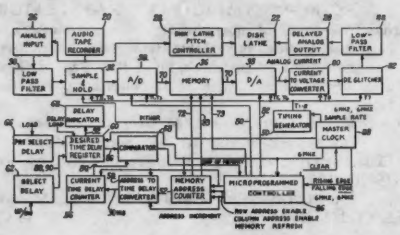
David L. Haynes, San Mateo, and John M. Brennan, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed May 15, 1980, Ser. No. 149,819

Continuation-in-part of PCT/US79/00314, United States of America, abandoned.

Int. Cl.³ G11B *3/00*; G11C *15/00*

U.S. Cl. 369—60 **5 Claims**



1. A digital delay apparatus for use in a disk mastering preview system wherein audio signals from an audio source are delayed by a predetermined and adjustable time delay for previewing the audio signals to be recorded by a disk lathe, characterized by sampling means for sampling the audio signal to produce analog sample signals of said audio signal; analog to digital conversion means for converting said analog sample signals to digital sample signals; memory means for storing said digital sample signals and having a sufficient number of memory address locations to store the number of digital sample signals that correspond to the maximum predetermined delay; means for addressing said memory locations and for controlling the writing and reading of said digital sample signals into and out of said memory means at said address locations, respectively, said addressing means successively addressing said address locations of said memory means at a predetermined rate corresponding to the rate at which said analog samples were taken, the total number of address locations of said memory means that are addressed corresponding to the number of digital sample signals that occur during the predetermined delay, said addressing and controlling means being operable to sequence through said number of address locations and read the digital sample signals from each address location followed by writing a new digital sample signal at each address location before the next address location is addressed, the total number of address locations being addressed being adjustable in accordance with the amount of delay that is desired; and digital to analog conversion means for converting said digital sample signals read from the memory into analog signals for recording.

4,348,755

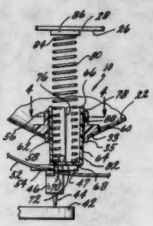
SPLIT TUBULAR MEMBER FOR COUPLING A TONEARM TO A SPEAKER CONE

John T. Benson, Canoga Park, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 23, 1981, Ser. No. 228,034

Int. Cl.³ G11B *3/00*

U.S. Cl. 369—155 **4 Claims**



1. In combination with a phonograph device including a record, a speaker cone having a collar, a tonearm including a needle, means mounting said tonearm in said phonograph device in a manner such that said needle may move toward and from said record, a tubular member reciprocably mounted in said collar for providing a connection between the tonearm and speaker cone which allows movement of the needle relative to the record without movement of the speaker cone, said tubular member having a closed end, and a compression spring biasing said closed end of said tubular member into engagement with said tonearm, the improvement which comprises:

means for conforming said tubular member to the inside diameter of said collar, said conforming means including means for changing the external configuration of said tubular member.

4,348,756

RECORD PLAYER CONTROL MECHANISM

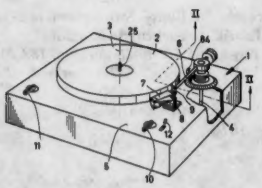
Michel H. F. Decoster, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,711

Claims priority, application Netherlands, Feb. 12, 1980, 8000860

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—226 **11 Claims**



1. A record player having a frame (1) on which a turntable (2) is mounted for rotation and in which a pick-up arm spindle (4) is journalled; a pick-up arm (6) and a pick-up arm lever (13) connected to said spindle; a control member (27) carried on the frame by which the pick-up arm can be controlled in a first direction of movement about the axis of the spindle away from the turntable and in a second direction of movement about the axis of the spindle towards the turntable; a rod (47) connected to the control member; a control element (52) which cooperates with said rod and which comprises a coupling portion (59) which, at least for controlling the pick-up arm in the second direction of movement, is engageable with a coupling portion (16) of the pick-up arm lever, characterized in that the frame (1) carries guide means (63, 64; 87) for the control element (52).

arranged such that when the pick-up arm (6) is controlled in the first or the second direction of movement, said guide means guide the coupling portion (59) of the control element over a first and a second path respectively, which paths are substantially concentric with the axis of the pick-up arm spindle (4), the first path being situated at a greater radial distance from said axis than the second path, and the coupling portion of the control element being engageable with the coupling portion (16) of the pick-up arm lever (13) in the second path only.

4,348,757

TRANSCEIVERS

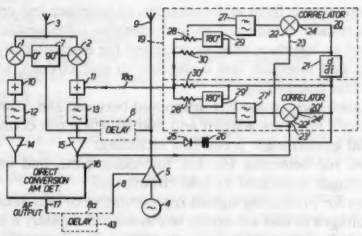
Christopher K. Richardson, Romsey, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 23, 1980, Ser. No. 161,786

Claims priority, application United Kingdom, Jun. 29, 1979, 7922701

Int. Cl.³ H04J 3/04

U.S. Cl. 370—32 **8 Claims**



1. A common channel duplex a.m. transceiver comprising a pair of multiplicative mixers arranged to receive signals from two sources, receiver aerial means constituting one of the sources and arranged to feed received signals to the multiplicative mixers, transmitter aerial means, and oscillator/modulator means constituting the other of the sources and arranged to feed signals for transmission to the serial means and to provide for the mixers of the pair local oscillator signals which are at the same frequency as the carrier frequency for transmission, and wherein it is arranged that the carrier frequency for transmission and the carrier frequency of the received signals are common to a single channel of the transceiver, phase quadrature means connected to provide a phase quadrature relationship between two signals fed to the mixers of the pair from one of the sources, a pair of signal combiners fed one from each mixer, a pair of low pass filters fed one from each combiner, a pair of correlator arrangements each having first and second input ports and an output port, the first input port of each correlator arrangement being fed one from each low pass filter, detector means via which signals from the oscillator/modulator means are fed to respective second input ports of the correlators, the correlator arrangements being operative to correlate signals derived from the low pass filters with detected signals from the oscillator/modulator means thereby to provide at the said output ports feedback signals which are fed one from each correlator to respective combiners, and an a.m. demodulator responsive to signals fed from the low pass filters for providing a.m. output signals corresponding to a.m. modulation carried by the received signals.

4,348,758

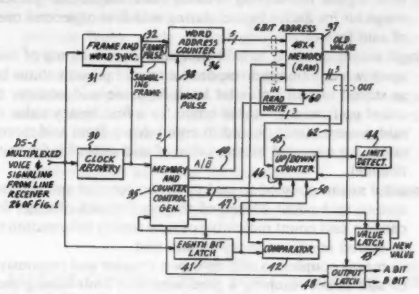
DIGITAL DEBOUNCING AND STORAGE APPARATUS FOR USE IN A TELEPHONE SWITCHING SYSTEM

Joseph E. Sutherland, Raleigh, N.C., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 4, 1980, Ser. No. 156,298

Int. Cl.³ H04J 3/12

U.S. Cl. 370—110.2 **7 Claims**



1. A digital debouncing and storage apparatus for use in recovering status signaling information contained in a serially transmitted digital multiplex signal as transmitted in a telephone system with said signal having repetitive frames of information each frame consisting a group of channels, each channel having the same given number of bits, with certain first ones of said frames reserved for first status information with at least one A status bit in each channel of said first frames indicative of a first status condition of said associated channel and with second different ones of said frames reserved for second status information with at least one B status bit at the same location as said A bit in each channel of said second frames indicative of a second status condition of said associated channel, with both said status bits as generated by said telephone system capable of undesirably providing a false indication of the proper status of said channel due to contact bounce which may undesirably occur during the generation of said first and second status information comprising:

means responsive to said multiplex signal for generating a first signal indicative of each of said transmitted frames, a second signal indicative of only said first ones of said frames, a third signal indicative of only said second ones of said frames, a fourth signal indicative of each channel in each frame, and a fifth signal indicative of said location of said A or B bit in each of said channels,

memory means having a plurality of addressable storge locations, with a first plurality of said storage locations each one associated with one channel in said group and capable of storing therein a given number of bits with at least one bit indicative of said A bit in said associated channel, and with a second plurality of said storage locations each one associated with one channel in said group and capable of storing therein said given number of bits with at least one bit indicative of said B bit, with said additional bits as stored in said first and second locations indicative of timing information associated with said respective status bit,

a word address counter coupled to said memory means and said timing means and responsive to said fourth signal to provide a plurality of binary address codes for each channel in said group, and responsive to said second and third signals to modify said address codes by one bit to thereby provide first address codes to access said memory means at said first plurality of locations indicative of A status bits, and second address codes to access said memory means at said second plurality of locations indicative of B status bits,

an up-down counter coupled to said memory means and

having a first input adapted when activated to cause said counter to count-up from a stored count and a second input adapted when activated to cause said counter to count down from said stored count, said up-down counter adapted to sequentially store said timing information for each channel as stored in said memory for said A and B bits,

a status bit latch responsive to said multiplex signal and said fifth signal for storing therein said respective present status bit for each channel during said first or second ones of said frames,

logic means coupled to said first and second inputs of said up-down counter and responsive to said present status bit as stored in said status bit latch to cause said counter to count up from said stored count for a first binary value of said present status bit and to count down from said stored count for a second binary value of said status bit for each channel,

control means coupled to said up-down counter and responsive to said count contained therein for said channel for causing said count indicative of new timing information to be stored in said memory means, and

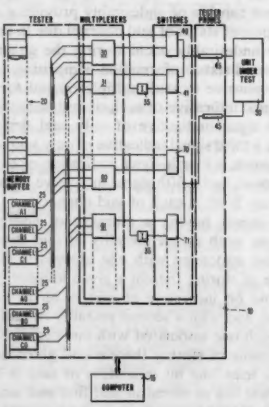
limit means coupled to said up-down counter and responsive to said count reaching a predetermined limit during successive first and second ones of said frames for changing the value of said status bit as stored in said memory upon detection of said predetermined limit.

4,348,759

AUTOMATIC TESTING OF COMPLEX SEMICONDUCTOR COMPONENTS WITH TEST EQUIPMENT HAVING LESS CHANNELS THAN THOSE REQUIRED BY THE COMPONENT UNDER TEST

Henri D. Schnurmann, Monsey, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,481
Int. Cl.³ G06F *11/12*; G01R *15/12*
U.S. Cl. 371—20 **5 Claims**



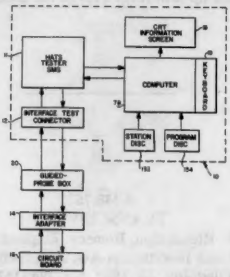
1. An apparatus for testing large or very large integrated circuit packages, said apparatus including: a stored program computer; a tester interconnected with said computer said tester including, a memory buffer having m binary outputs, n tester channels, a plurality of multiplexer circuits connected to said n tester channels, a plurality of tester probes for contacting input and output contacts of a unit under test (UUT), and a plurality of solid state switches interconnecting said memory buffer, said plurality of multiplexer circuits and said plurality of test probes; and, said apparatus being characterized by the ability to effectively test a unit under test having a greater number of inputs and outputs than said n tester channels.

4,348,760

DIGITAL-FAULT LOOP PROBE AND SYSTEM

Steven J. Rice, Redlands, and Donald E. Sherman, Mission Hills, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Sep. 25, 1980, Ser. No. 190,684
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—20 **25 Claims**



1. In a dynamic automatic test system for testing circuits, said system including a stimulus measurement system, a computer arranged for receiving and delivering signals from and to said stimulus measurement system, an information screen for receiving signals from said computer, an interface test connector electrically connected to said stimulus measurement system, and an interface adapter arranged for electronically connecting said interface test connector to said circuits, the improvement comprising:

a guided-logic probe box interposed between and connected to said interface adapter and said interface test connector, said guided-logic probe box including:

means for detecting Hi, Lo, forbidden zone, and impulse voltages generated by said circuit; and

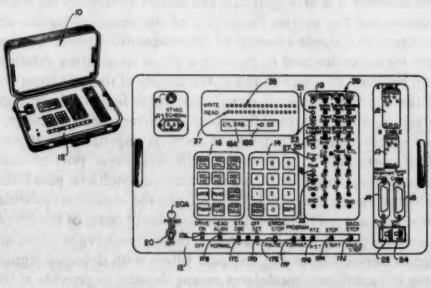
means for presenting signals representative of said generated voltages to said automatic test system computer, whereby said dynamic automatic test system is provided with a guided-probe capability.

4,348,761

PORTABLE FIELD TEST UNIT FOR COMPUTER DATA AND PROGRAM STORAGE DISC DRIVE

James K. Berger, Malibu, Calif., assignor to Pioneer Research, Inc., Santa Monica, Calif.

Filed Sep. 8, 1980, Ser. No. 184,811
Int. Cl.³ G06F *11/22*
U.S. Cl. 371—21 **10 Claims**



1. A programmable test unit for qualifying a disc drive comprising: programmable format memory means for storing different sector format programs for different disc drives; address circuitry connected to said format memory mean for selecting different formats from said format memory means

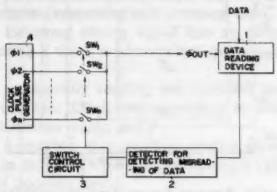
and following the byte count of each disc sector in real time of the disc drive being qualified; and output circuitry connected to said format memory means for establishing the sector format of the disc drive being qualified.

4,348,762

CIRCUIT FOR CORRECTING DATA READING CLOCK PULSES

Toshimi Shiun; Hideo Fujii, and Yoshio Kizaki, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 176,974
Claims priority, application Japan, Sep. 14, 1979, 54-117375
Int. Cl.³ H04L *7/00*
U.S. Cl. 371—47 **4 Claims**



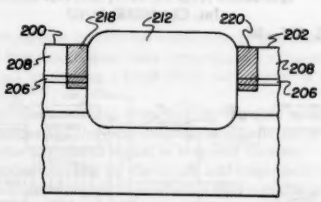
1. A circuit for correcting data reading clock pulses, which comprises:
- a means for generating a plurality of groups of clock pulses of different phases;
- a switch means for selecting and outputting one or more groups of clock pulses from said plurality of groups of clock pulses;
- a means for reading data in response to said one or more groups of clock pulses selected by said switch means;
- a means for detecting mis-reading of the data and outputting a detection signal indicating mis-reading; and
- a switch control means responsive to said detection signal to control said switch means so as to repeatedly select another group or groups of clock pulses until correct data reading is accomplished as determined by absence of said detection signal.

4,348,763

MULTIPLE STRIPE LEAKY MODE LASER

Donald E. Ackley, Los Altos; Reinhart W. H. Engelmann, Mountain View, and Dietrich Kerps, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 7, 1980, Ser. No. 176,166
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **1 Claim**



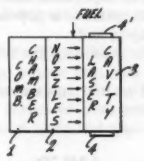
1. A semiconductor laser comprising:
- a substrate of semiconducting material;
- a plurality of stripe regions on the substrate, each having an active layer in which lasing is induceable by injection of charge carriers; each of the stripe regions including:
  - (a) a first clad layer of semiconducting material positioned on the substrate and having lower refractive index than the active layer, the active layer being positioned on the first clad layer;
  - (b) a second clad layer of semiconducting material positioned on the active layer and having lower refractive index than the active layer;
- a plurality of passive regions of semiconducting material positioned on the substrate, adjacent stripe regions being laterally separated by one of the passive regions, the passive regions and the stripe regions being configured to provide leaky mode optical coupling between adjacent stripe regions; each passive region having a refractive index higher than the effective refractive indices of adjoining stripe regions, at least one of the stripe regions including a zone at a lateral boundary having refractive index higher than the effective refractive index of the stripe region but lower than the refractive index of the passive region adjoining the boundary;
- a pair of mirrored facets at opposite ends of the substrate; and electrode means for supplying electrical current.

4,348,764

NOZZLE CONSTRUCTION FOR CHEMICAL LASER

Robert J. Cavalleri, Cocoa Beach, Fla.; Lamar F. Moon, Agoura, and John F. Hon, Tarzana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 15, 1979, Ser. No. 94,522
Int. Cl.³ H01S *3/02*
U.S. Cl. 372—58 **11 Claims**



1. A nozzle construction, particularly for a chemical laser for combining a primary flow of a first gas such as an oxidizer, with a second gas such as a fuel, comprising:
- a first nozzle having an entry and an exit for providing a supersonic source flow expanding through said first nozzle in parallel planes at right angles to a line defining the source of the flow, the planes including a direction oriented radially through said first nozzle towards a laser optical cavity; and
- a plurality of curved, second nozzles disposed adjacent to the exit of said first nozzle, said second nozzles being curved in said planes and arranged side by side in the direction of said line, said second nozzles being spaced along the direction of said line for the passage of said primary flow between adjacent ones of the second nozzles.

4,348,765

THERMIONIC LASER

Peter E. Oettinger, Acton, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

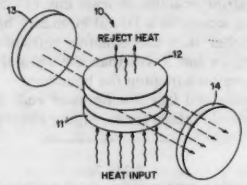
Filed Feb. 25, 1980, Ser. No. 124,394
Int. Cl.³ H01S *3/09*
U.S. Cl. 372—78 **10 Claims**

1. A thermally driven laser operable in the d.c. mode comprising:
- (1) an emitter for emitting electrons;
- (2) a collector spaced apart from said emitter and defining a region therebetween, said collector operable to collect electrons emitted by said emitter;
- (3) a fully reflecting element disposed adjacent to the region separating said emitter and said collector;

(4) a partially reflecting element disposed adjacent to said region separating said emitter and said collector and opposite to said fully reflecting element, said fully reflecting element and said partially reflecting element defining therebetween an optical cavity suitable for lasing;

(5) a vapor disposed in said optical cavity between said emitter and said collector, said vapor being a vapor of an element selected from the group consisting of cesium, rubidium, potassium, sodium, lithium, barium, and mixtures thereof;

(6) an additive intermixed with said vapor to form therewith



a lasing material, said additive consisting of atoms or molecules whose excited state populations are minimally affected by electromotive forces between said emitter and said collector, said atoms or molecules having excited states in resonance with specific lower energy states of said vapor so as to depopulate said specific lower energy states thereby to produce a population inversion in the atoms of said vapor; and

(7) a heat source for providing thermal energy to pump said lasing material, said heat source operable to drive electrons from said emitter toward said collector, thereby generating a current.

4,348,766

CHEMICALLY FUELLED LASER AND METHOD FOR INCREASING THE EFFICIENCY OF SUCH LASERS

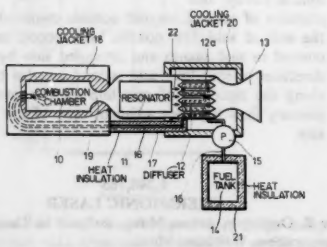
Gunthard Born, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,504

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906632

Int. Cl.³ H01S *3/09*

U.S. Cl. 372—89 **8 Claims**



1. A method for increasing the efficiency of a chemically fuelled CO_2 laser including a combustion chamber and a diffuser, comprising the steps of cooling said diffuser by means of chemical laser fuels selected from the group consisting of CO_2, N_2O, C_6H_6, and N_2, whereby the heat content of said laser fuels is increased, and supplying said laser fuels with the increased heat content into the combustion chamber through a heat insulated supply conduit, whereby the heat content gained by said laser fuels in the diffuser is supplied to the combustion chamber and thus to a laser gas produced in said combustion chamber from said laser fuels through said heat insulated supply conduit, whereby the CO_2 content of said laser gas is substantially reduced to 50% as compared to the CO_2 content of a laser gas in a conventional CO_2 laser.

4,348,767

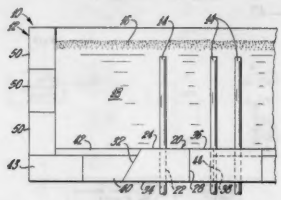
WEDGE SHAPED ELECTRODE BLOCK

Gordon A. Farrar, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 29, 1980, Ser. No. 220,322

Int. Cl.³ C03B *5/027*

U.S. Cl. 373—30 **5 Claims**



1. An electric furnace for melting thermoplastic material, said furnace comprising: a chamber having a bottom wall and sidewall and being adapted for holding said thermoplastic material; a first block having an aperture adapted for mating with an electrode and having a top and a first side that is perpendicular to said top, said first block being located in said bottom wall of said chamber; a second block having an aperture adapted for mating with an electrode and having a top, bottom, a first side that is perpendicular to said top of said second block and located adjacent to said first side of said first block and a second side opposite said first side of said second block, said second side being slanted such that said top of said second block has an area that is smaller than the area of said bottom of said second block; a third block having a top, bottom, and a first side that is slanted such that the area of said top of said third block is larger than the area of said bottom of said third block, said first side of said third block being slanted at substantially the same angle as said second side of said second block and said first side of said third block being positioned adjacent said second side of said second block.

4,348,768

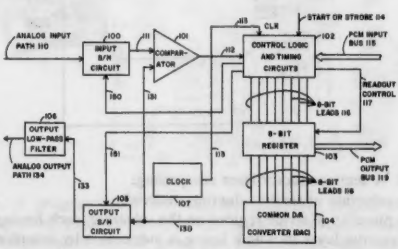
PCM CODEC USING COMMON D/A CONVERTER FOR ENCODING AND DECODING

Carl G. Svala, Delaware, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 830,779, Sep. 6, 1977, abandoned. This application Aug. 24, 1979, Ser. No. 69,374

Int. Cl.³ H03K *13/02*

U.S. Cl. 375—26 **18 Claims**



1. In a communication coding and decoding system for encoding an incoming analog signal into an outgoing PCM

signal and also decoding an incoming PCM signal into an outgoing analog signal, all within a selected time period corresponding to one cycle at a basic sampling frequency, the combination comprising:

means for receiving said incoming PCM signal within said time period;

decoding means comprising a common digital-to-analog converter (DAC) and control means for setting said DAC in accordance with said received PCM signal to a first decision level adjacent to one side of a desired analog reconstruction level within a first predetermined portion of said time period;

means for modifying said received PCM signal; said control means utilizing said modified PCM signal for resetting said DAC to a second decision level adjacent to the opposite side of said reconstruction level within a second predetermined portion of said time period;

encoding means comprising said common DAC for encoding said incoming analog signal into an outgoing PCM signal during a third predetermined portion of said time period;

means for sequentially reading out resultant analog signal levels from said DAC corresponding to said first and second decisions levels; and

means for averaging said resultant analog signal levels to provide an outgoing analog signal having a value intermediate said decision levels.

4,348,769

CIRCUITRY FOR EXTRACTION OF A TRANSMISSION CLOCK SIGNAL FROM-MODULATED DATA TRANSMISSIONS

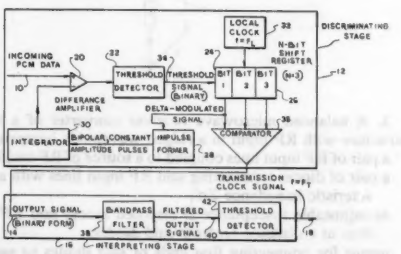
Ludwig Kittel, Heroldsberg, Fed. Rep. of Germany, assignor to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,688

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906886

Int. Cl.³ H03K *13/22*

U.S. Cl. 375—28 **5 Claims**



1. In an electronic circuit for extraction of a transmission clock signal from modulated data transmissions, comprising:

a local clock producing a local clock pulse signal at a high frequency;

a delta-modulation circuit responsive to the data modulated transmissions and the local clock pulse signals and producing a delta-modulated signal in response thereto;

a shift register clocked by the clock and responsive to the delta-modulated signal to produce a data word in parallel form;

a comparator connected to the shift register and operating in a manner that the comparator produces a logically high output signal when all bits are identical and producing a logically low output signal otherwise; and an interpreting stage responsive to periodicity of the output signals generated by the comparator and producing an extracted transmission clock signal having a periodicity equal to periodicity of the transmission clock signal and being in phase therewith.

4,348,770

MANUAL CHANNEL SELECTION APPARATUS

Tatsuo Ito, Kobe, Japan, assignor to Fujitsu-Ten, Ltd., Kobe, Japan

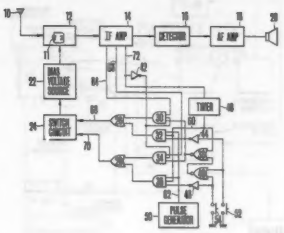
PCT No. PCT/JP79/00015, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO79/00544, PCT Pub. Date Aug. 9, 1979

PCT Filed Jan. 23, 1979, Ser. No. 217,321

Claims priority, application Japan, Jan. 24, 1978, 53-7189[U]

Int. Cl.³ H03J *7/26*; H04B *1/26*

U.S. Cl. 455—164 **1 Claim**



1. A manual channel selection apparatus in an electronic tuning radio receiver having variable reactance elements comprising:

manual selection switches for each of the upward and downward directions;

voltage source for generating a bias voltage which is gradually increased or decreased during input of an upward signal or a downward signal and applied to said reactance elements; and

gate circuit means for temporarily interrupting the upward or downward output signal from said switches to said voltage source upon reception of a broadcasting wave and inputting an automatic frequency control voltage to said voltage source during said interruption whereby said gate circuit means includes a first logic means for passing the output of a pulse generator therethrough while the upward manual channel selection switch is being pushed and during issue of an "H" level output from a timer which issues "L" level output for a certain period upon generation of an intermediate frequency output, further including a second logic means for passing the output of said pulse generator therethrough while the downward manual channel selection switch is being pushed and during issue of an "H" level output from said timer, and a third and a fourth logic means for passing therethrough an automatic frequency control signal in the upward or the downward direction respectively while said timer issues an "L" level output and either of the upward or the downward manual selection switch is being pushed.

4,348,771

DIGITAL TUNING SYSTEM FOR A RADIO RECEIVER

Otto Klank, Arpke; Dieter Rottmann, Hanover, and Helmut Wössner, Ronnenberg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 3, 1979, Ser. No. 81,383

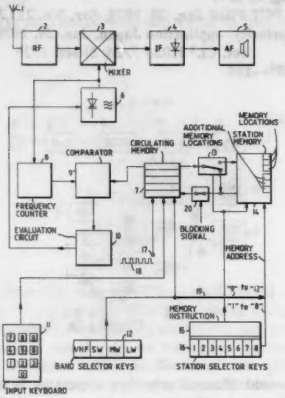
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843214

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—180 **9 Claims**

1. In a digital tuning system for a radio receiver, which system includes a station memory having a plurality of mem-

ory locations for storing digit representations identifying respective broadcast frequencies to be received, a plurality of station selector elements each connected to be manually actuatable for addressing a respective memory location to cause the tuning system to tune the receiver to the broadcast frequency identified by the representations stored in the addressed memory location, and a plurality of band selector elements each connected to be manually actuatable for causing the receiver to be tuned within a respective signal band, the improvement



wherein said station memory comprises a plurality of additional memory locations each storing a digit representation of a selected broadcast frequency in a respective signal band, and each said band selector element is connected to address, upon being actuated, a respective additional memory location to cause the tuning system to tune the receiver to the broadcast frequency identified by representations stored in a said additional memory location when addressed by an actuated band selector element, said additional memory locations not being addressable by said station selector elements.

4,348,772

FREQUENCY STABILIZATION CIRCUIT FOR A LOCAL OSCILLATOR

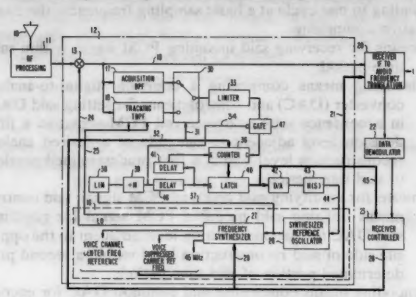
Kenneth W. Leland, Howell, and Nelson R. Sollenberger, Ocean, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1979, Ser. No. 97,422
Int. Cl.[3] H04B 1/16
U.S. Cl. 455—260 **14 Claims**

1. In a frequency stabilization circuit in which the offset between a prdetermined frequency and a received signal frequency related to an output of a local oscillator includes a slowly changing local oscillator drift component and a rapidly changing received signal frequency modulation component, the improvement comprising

means for counting (36) cycles in said received signal frequency,

means, responsive to an output of said local oscillator, for controlling (38, 39, 46, 41) said counting means to produce therefrom a control signal having a magnitude representing the average of said offset over a time interval which is defined by an output of said local oscillator, and



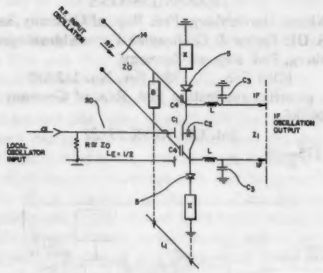
means for applying (40, 42, 43) said control signal to control the frequency of said local oscillator.

4,348,773

MICROWAVE RECEIVER CONVERTERS HAVING A HYBRID WAVEGUIDE STRUCTURE

Ignazio Caroli, Via Luigi Capuana, 135, 00137 Roma, Italy

Filed Jan. 15, 1980, Ser. No. 112,285
Int. Cl.[3] H04B 1/26; H03D 7/14
U.S. Cl. 455—326 **6 Claims**



1. A balanced microwave receiver converter of a hybrid structure with RF input in a ridged waveguide comprising:

a pair of RF input lines coupled to a source of RF oscillation,

a pair of diodes terminating said RF input lines with a characteristic impedance Zo',

an adjustable susceptance B disposed across said RF input lines at a distance l_1, from said diodes,

means for connecting first ends of said diodes to said RF input lines, and further means connecting the other ends of said diodes to ground via reactances X,

means for capacitive coupling C_2 for coupling together the first ends of said diodes,

a pair of output lines for an IF signal and having a characteristic impedance Z,

means for connecting one ends of said IF output lines to said first ends of said diodes, said connecting means including a pair of helical inductive elements L, having junction ends connected to said IF output lines,

means for capacitive coupling C_3 for coupling said junction ends to ground,

means associated with a structure of said waveguide for coupling a source of LO oscillation to said IF output lines and to said first ends of the diodes, said coupling means including a capacitive coupling C_1 and a resistance R having a value of Zo being disposed in parallel with said capacitive coupling C_1 at a distance of l_2 from said diodes.

DESIGN PATENTS

GRANTED SEP. 7, 1982

ERRATA

For CLASS	See PATENT NO.
D34–004	266,052

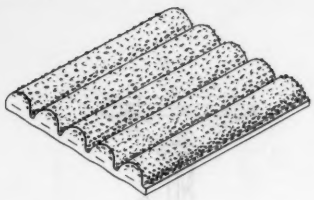
DESIGN PATENTS

GRANTED SEPT. 7, 1982

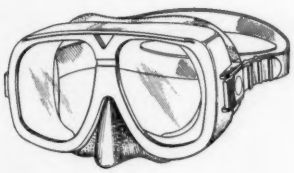
CONTACTS

To	
CLASS	
D21-504	

266,030
TOASTER BREAD STICK PRODUCT
Anthony F. Madonia, 15 Villa Moraine Dr., Cheektowaga, N.Y. 14225, assignor to Anthony F. Madonia, Grand Island, N.Y.
Filed Apr. 10, 1980, Ser. No. 139,016
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—23



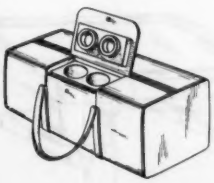
266,031
DIVER'S MASK
Hiromasa Sato, Zuahi, Japan, assignor to Tabata Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1979, Ser. No. 91,901
Claims priority, application Japan, Apr. 15, 1979, 54-15087
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



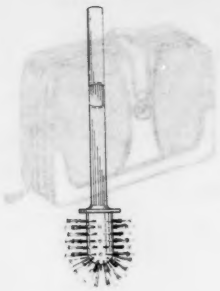
266,032
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Aug. 14, 1978, Ser. No. 933,723
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

266,033
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Aug. 14, 1978, Ser. No. 933,727
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

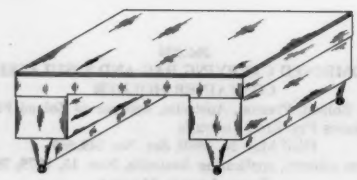
266,034
COMBINED CARRYING BAG AND INSULATED CONTAINER HOLDER
Martin Zoland, Preston, Australia, assignor to Zoland Fischer Nominees Pty. Ltd., Australia
Filed May 14, 1980, Ser. No. 149,669
Claims priority, application Australia, Nov. 15, 1979, 79582
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—71

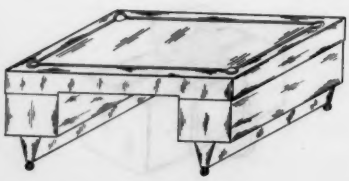


266,035
TOILET BRUSH
Bruce R. Thompson, Tranmere, Australia, assignor to UPL Group Limited, Brisbane, Australia
Filed Feb. 13, 1980, Ser. No. 121,212
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—12



266,036
COMBINED DESK AND BILLIARD TABLE
Leonides Y. Teves, 623 39th St., West Bradenton, Fla. 33505
Filed Feb. 20, 1980, Ser. No. 122,991
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—4

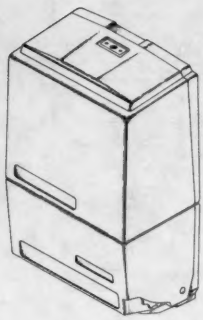




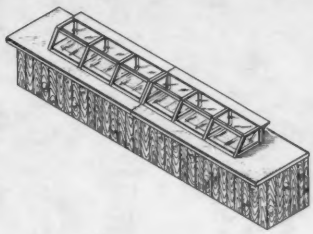
266,037
STOOL
R. N. Heighberger, c/o Jos. Dyson & Sons, Inc., 33300 Lakeland Blvd., Eastlake, Ohio 44094
Filed Jan. 4, 1980, Ser. No. 109,633
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

266,038
SEAT
William B. Raftery, Ann Arbor, and Ronald L. Whitwam, Caledonia, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 11, 1979, Ser. No. 47,099
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

266,039
TOWEL DISPENSER
Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed Mar. 21, 1980, Ser. No. 132,695
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—96

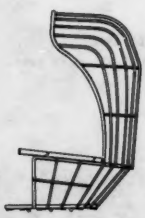


266,041
SERVING COUNTER
Henry N. Saurage, III, and Donna M. Saurage, both of Baton Rouge, La., assignors to Community Coffee Company Inc., Baton Rouge, La.
Filed Apr. 28, 1980, Ser. No. 144,627
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—144

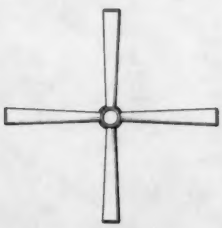


266,042
COMBINED KITCHEN CABINET DOOR AND SUPPORT FRAME THEREFOR
Basil T. Moore, Rte. #2, Falls City, Nebr. 68355, and Morley Zipursky, 1021 N. 63rd St., Omaha, Nebr. 68132
Filed Sep. 17, 1979, Ser. No. 76,044
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—192

266,040
SUSPENDED CHAIR
Michael J. Cope, 195 Boulevard Dr., St. Ignace, Mich. 49781
Filed Jan. 17, 1980, Ser. No. 113,086
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—113



266,043
FURNITURE BASE
Kenneth H. Striebel, Kokomo, Ind., assignor to Kofabco, Inc., Peru, Ind.
Filed Sep. 12, 1979, Ser. No. 74,877
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



266,044

AUXILIARY SEAT FOR A CHILD

Gaynor J. Blanchard, 2 Chilton Parade, Turramurra, New South Wales 2074, Australia

Continuation-in-part of Ser. No. 968,143, Dec. 11, 1978. This application Jul. 30, 1979, Ser. No. 62,209

Claims priority, application Australia, Jun. 14, 1978, 75053

The portion of the term of this patent subsequent to Jun. 8, 1996, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*99*

U.S. Cl. D6—201

266,045

PLACE MAT

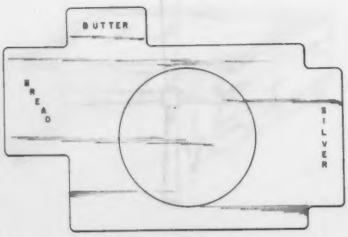
Medhat M. Kamel, Alexandria, and Mortimer R. Dock, Arlington, both of Va., assignors to T-Star Research, Inc., Alexandria, Va.

Filed Sep. 13, 1979, Ser. No. 75,504

Term of patent 14 years

Int. Cl. D6—*13*

U.S. Cl. D6—271



266,046

TUMBLER OR SIMILAR ARTICLE

Timo Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

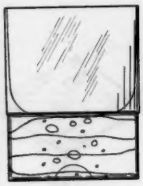
Filed Nov. 9, 1979, Ser. No. 92,662

Claims priority, application Finland, May 18, 1979, 333/79

Term of patent 14 years

Int. Cl. D07—*01*

U.S. Cl. D7—15



266,047

DECORATIVE BAND FOR CASSEROLE HOLDERS OR THE LIKE

Cynthia S. Gerow, Ballston Spa, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 14, 1980, Ser. No. 149,678

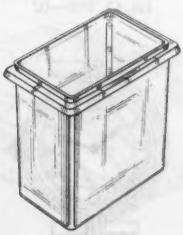
Term of patent 14 years

Int. Cl. D7—*06*

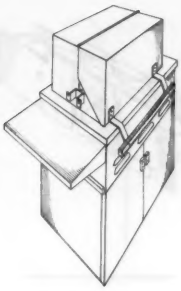
U.S. Cl. D7—39

266,048
COLLAPSIBLE BOTTLE OR CAN HOLDER
Robert V. Zills, 1816 16th St., NW., Winter Haven, Fla. 33880
Filed Aug. 11, 1980, Ser. No. 177,362
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

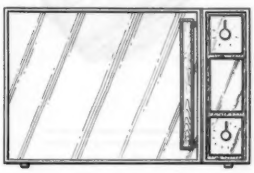
266,049
FOOD STORAGE CONTAINER OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 16, 1980, Ser. No. 112,663
Term of patent 14 years
Int. Cl. D7—*01, 07*
U.S. Cl. D7—76



266,050
GRILL ASSEMBLY
Willie H. Best, 18C The Heritage, Columbia, S.C. 29201
Filed Mar. 13, 1980, Ser. No. 130,129
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—108

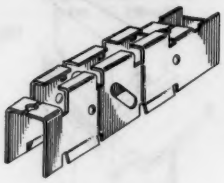


266,051
MICROWAVE OVEN
Donald G. Wolfe, Lake Barrington, and Joseph R. Mango, Midlothian, both of Ill., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Division of Ser. No. 909,210, May 24, 1978. This application Mar. 3, 1980, Ser. No. 162,556
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



266,052
CORSET-SHAPED RECEPTACLE
David C. Moser, P.O. Box 9, Watervliet, Mich. 49098
Filed Sep. 10, 1979, Ser. No. 74,106
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D34—4

266,053
CAGE FOR THE SUPPORT ROLLERS OF A SLIDING WINDOW OR SIMILAR ARTICLE
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Oct. 23, 1978, Ser. No. 953,956
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—402

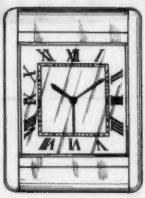


266,054
INSERTABLE WEDGE GUARD FOR DOOR LOCKS
Joan L. Goodman, 11527 Wickersham, Houston, Tex. 77077
Filed Mar. 24, 1980, Ser. No. 133,654
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—343

266,055
BOTTLE GUARD
William Schroeder, Jr., North Muskegon, and Raymond N. Fink, Williamston, both of Mich., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Nov. 5, 1979, Ser. No. 91,319
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434

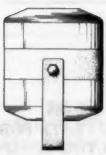
266,056
COVER FOR WATERCOOLER BOTTLES
Magda C. Lear, 22532 Ventura Blvd., Woodland Hills, Calif. 91364
Filed Nov. 13, 1979, Ser. No. 93,189
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—444

266,057
ALARM CLOCK
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Apr. 9, 1980, Ser. No. 138,270
Claims priority, application Switzerland, Oct. 11, 1979, 69435
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—26

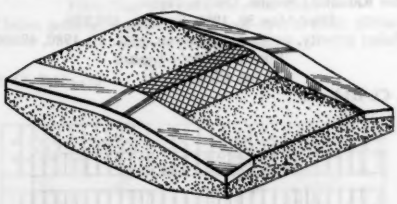


266,058
WATCH
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Apr. 9, 1980, Ser. No. 138,271
Claims priority, application Switzerland, Oct. 11, 1979, 69436
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

266,059
COMPASS
Thomas T. Drake, Slip 152 Old Port Cove, N. Palm Beach, Fla. 33480
Filed Feb. 1, 1980, Ser. No. 117,807
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—68



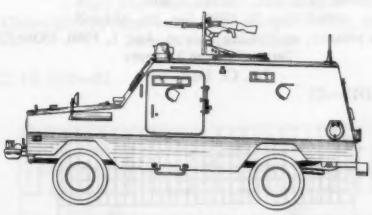
266,060
REFLECTIVE PAVEMENT MARKER FOR ROADS
Angelo V. Beretta, Lincoln, R.I., assignor to Durastone Company, Inc., Lincoln, R.I.
Filed Nov. 12, 1980, Ser. No. 208,132
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—113



266,061
COMBINED EMERGENCY SIGNAL LIGHT AND MOUNTING BRACKET THEREFOR
Karl H. Wenzlaff, 9800 Baseline Rd., Space 107, Alta Loma, Calif. 91701
Filed Sep. 21, 1979, Ser. No. 77,590
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D10—114

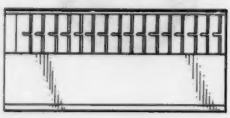
266,062
RING BAND
Clyde A. Austin, 60 Paul Ave., Mountain View, Calif. 94041
Filed Jun. 8, 1979, Ser. No. 46,768
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—26

266,063
ARMORED VEHICLE
James M. Bemiss, St. Clair Shores, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Mar. 30, 1979, Ser. No. 25,318
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

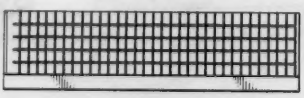


266,064
AUTOMOBILE TIRE
Yukio Sone, Atsugi, Japan, assignor to The Yokohama Rubber Co., Ltd., Shinbashi, Japan
Filed Jan. 7, 1980, Ser. No. 110,200
Claims priority, application Japan, Jul. 9, 1979, 54-28545
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

266,065
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,964
Claims priority, application Taiwan, Apr. 1, 1980, 6930623
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



266,066
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,965
Claims priority, application Taiwan, Apr. 1, 1980, 6930622
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

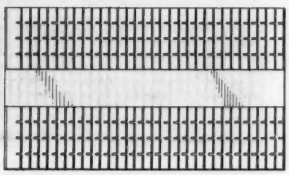


266,067
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,966
Claims priority, application Taiwan, Apr. 1, 1980, 6930620
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

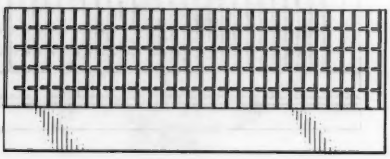
266,068
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,967
Claims priority, application Taiwan, Apr. 1, 1980, 6930621
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

266,069
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,970
Claims priority, application Taiwan, Mar. 31, 1980, 6930606
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

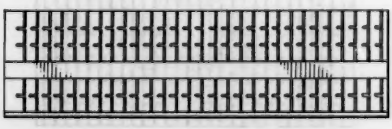
266,070
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,971
Claims priority, application Taiwan, Mar. 31, 1980, 6930607
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



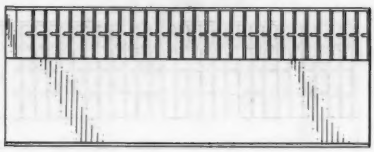
266,071
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,972
Claims priority, application Taiwan, Apr. 1, 1980, 6930618
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



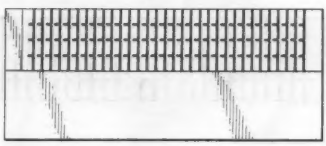
266,072
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,973
Claims priority, application Taiwan, Apr. 1, 1980, 6930619
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



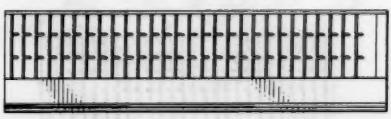
266,073
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,974
Claims priority, application Taiwan, Mar. 31, 1980, 6930604
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



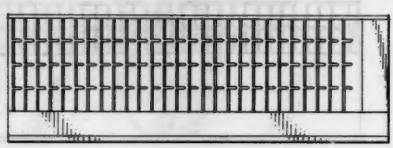
266,074
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,975
Claims priority, application Taiwan, Mar. 31, 1981, 6930603
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



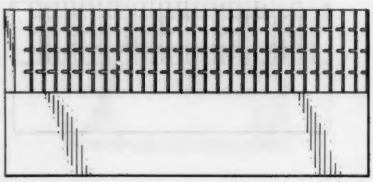
266,075
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,976
Claims priority, application Taiwan, Apr. 1, 1980, 6930616
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



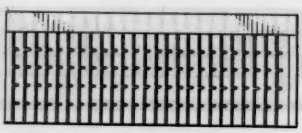
266,076
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Oyama, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,977
Claims priority, application Taiwan, Apr. 1, 1980, 6930617
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



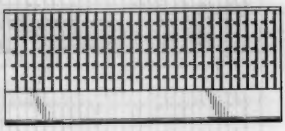
266,077
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Oyama, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,978
Claims priority, application Taiwan, Mar. 31, 1980, 6930602
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



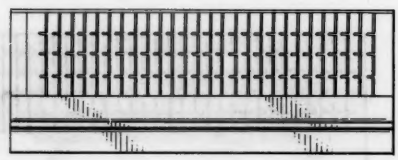
266,078
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Oyama, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,979
Claims priority, application Taiwan, Mar. 31, 1980, 6930610
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



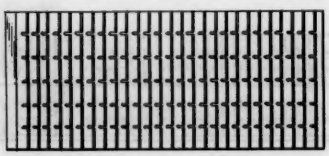
266,079
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Oyama, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,980
Claims priority, application Taiwan, Apr. 1, 1980, 6930615
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



266,080
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Oyama, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,981
Claims priority, application Taiwan, Mar. 31, 1980, 6930608
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



266,081
HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS
Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Filed May 30, 1980, Ser. No. 154,982
Claims priority, application Taiwan, Mar. 31, 1980, 6930609
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



266,082

HEAT RELEASING PLATE FOR MOUNTING SEMICONDUCTOR COMPONENTS

Yoshihiko Asanuma, Tochigi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

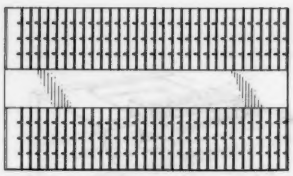
Filed May 30, 1980, Ser. No. 154,984

Claims priority, application Taiwan, Mar. 30, 1980, 6930605

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—23



266,083

CONTROL UNIT FOR INTERIOR OF A MOTOR VEHICLE

Helmut Klaus, Remshalden, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Fed. Rep. of Germany

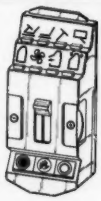
Filed Mar. 5, 1980, Ser. No. 127,497

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1979, 2MR 751

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—32



266,084

THERMOSTATIC SWITCH

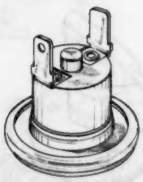
Robert J. Colavecchio, Johnston, R.I., assignor to Elmwood Sensors, Inc., Cranston, R.I.

Filed Apr. 14, 1980, Ser. No. 139,976

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—35



266,085

TELEPHONE HANDSET AMPLIFIER

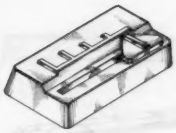
Leslie Perhacs, Jr., Port Ludlow, Wash., assignor to Proctor & Associates Company, Redmond, Wash.

Filed Apr. 30, 1979, Ser. No. 34,257

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—57



266,086

DIRECT STATION SELECTION CONSOLE

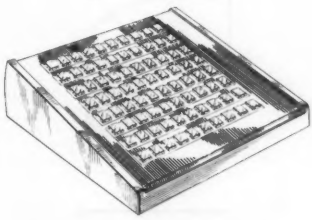
Donald A. Foggia, Ocean, N.J., and Roman F. Pomponi, Norwalk, Conn., assignors to TIE/Communications, Inc., Shelton, Conn.

Filed Sep. 24, 1979, Ser. No. 78,105

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—58



266,087

AUTOMATIC DIALING APPARATUS FOR TELEPHONE

Kenji Nakamura, and Naoko Hayashi, both of Aichi, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

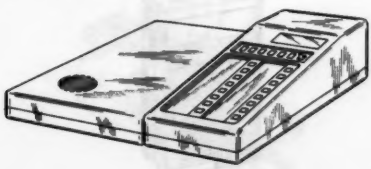
Filed Jun. 13, 1980, Ser. No. 159,432

Claims priority, application Japan, Feb. 22, 1980, 55-6546

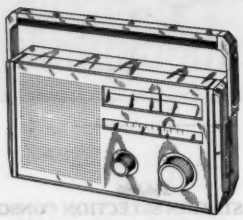
Term of patent 14 years

Int. Cl. D14—*03*

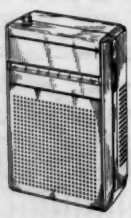
U.S. Cl. D14—66



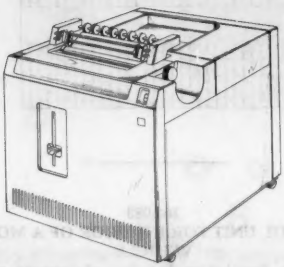
266,088
RADIO RECEIVER
Peter H. J. Van De Ven, Valdenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 27, 1980, Ser. No. 163,764
Claims priority, application United Kingdom, Jan. 3, 1980, 993031
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



266,089
RADIO RECEIVER
Peter H. J. Van De Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 27, 1980, Ser. No. 163,680
Claims priority, application United Kingdom, Jan. 3, 1980, 993034
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71

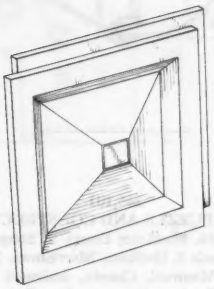


266,090
DATA PROCESSING CONSOLE
Myron F. Davis, Jr., and Joseph F. Talerico, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 19, 1980, Ser. No. 122,381
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—102

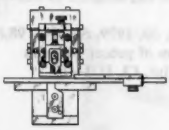


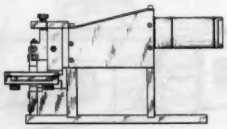
266,091
HYDRAULIC POWER PUMP
Robert E. Richards, Rte. 3, Box 145-E, Waxhaw, N.C. 28173, and Eckart F. Schultze, 3008 Goneaway Rd., Charlotte, N.C. 28210
Filed Jan. 14, 1980, Ser. No. 111,860
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—7

266,092
LINING TILE FOR AN ABRASIVE BLASTING MACHINE
William G. G. Tutton, Belper, England, assignor to Auto Alloys R&D Ltd., Derbyshire, England
Filed Oct. 23, 1979, Ser. No. 87,571
Claims priority, application United Kingdom, Apr. 24, 1979, 989626
Term of patent 14 years
Int. Cl. D15—*09*; D25—*01*
U.S. Cl. D15—126



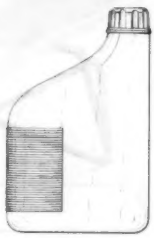
266,093
CHAIN CUTTER
Everett E. Cook, West View Rd., Wakefield, R.I. 02879
Filed Jul. 14, 1980, Ser. No. 168,032
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—129



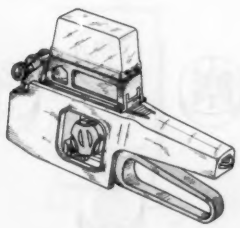


266,094
COLLAPSIBLE IMAGE VIEWING DEVICE
Marlin E. Gher, 12919 Valleywood Dr., Silver Spring, Md. 20906, and Steven G. Detsch, 4146 Bryan St., Oceanside, Calif. 92054
Filed Jul. 15, 1980, Ser. No. 169,262
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D16—18

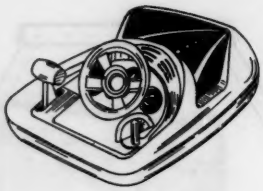
266,095
TONER CONTAINER OR THE LIKE
Kunio Hara, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Apr. 15, 1980, Ser. No. 140,587
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D16—27



266,096
PORTABLE APPARATUS FOR PRINTING AND DISPENSING LABELS
Werner Becker, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Dec. 18, 1978, Ser. No. 972,026
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, URA 578/78
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—19



266,097
TOY DRIVING SIMULATOR
Ronald R. Klawitter, Gasconade County, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.
Filed Jan. 3, 1980, Ser. No. 109,239
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—63

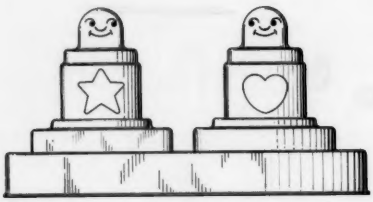


266,098
MEMO HOLDER
Richard A. Thornton, 2323-40th St., Des Moines, Iowa 50310
Filed Jan. 21, 1980, Ser. No. 113,787
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—86

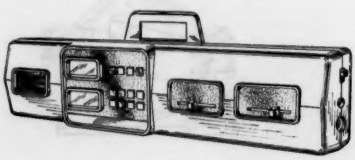
266,099
SET OF CHINESE CHESS PIECES
Mingder Shyu, 3105 Kipling Pl., Fremont, Calif. 94536
Filed Oct. 5, 1979, Ser. No. 82,151
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—52

266,100
SCOOTER
Frank P. Miller, P.O. Box 402, Brigham City, Utah 84302
Filed Jan. 24, 1980, Ser. No. 115,078
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76

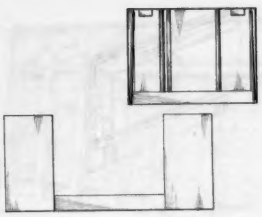
266,101
COMBINED PUZZLE AND CONSTRUCTION TOY
Lawrence B. Grubb, Monkton; Danny E. Simpson, Baltimore, both of Md.; Louis S. Hoffman, Morristown, N.J., and David M. Williams, Montreal, Canada, assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Nov. 20, 1979, Ser. No. 96,259
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—107



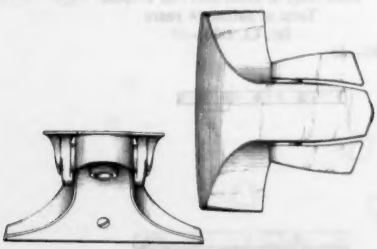
266,102
CONTROL UNIT FOR EXERCISER
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 30, 1979, Ser. No. 98,856
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191



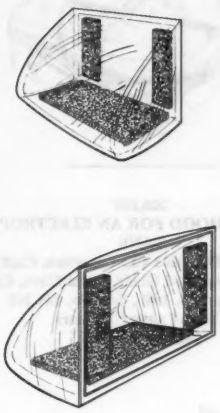
266,103
WATER CONTROL GATE
Wayne M. Carter, P.O. Box 666, Orinda, Calif. 94563
Filed Mar. 25, 1980, Ser. No. 133,891
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1



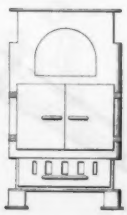
266,104
FAUCET
Dwight N. Johnson, San Marcos, Calif., assignor to JH Industries, Inc., San Marcos, Calif.
Filed May 8, 1980, Ser. No. 147,702
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



266,105
SOLAR ENERGY COLLECTOR FOR MOUNTING OVER WINDOWS OF BUILDINGS FOR SPACE HEATING THEREOF
Patricia M. Arrington, 3222 Denson Pl., Charlotte, N.C. 28215
Filed Mar. 21, 1980, Ser. No. 133,497
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72

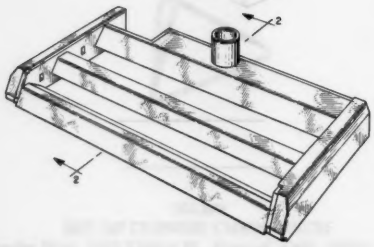


266,106
FURNACE
Ole A. Simonsen, N-4290 Foresvik, Norway
Filed May 5, 1980, Ser. No. 148,156
Claims priority, application Norway, Nov. 5, 1979, 60574
Term of patent 3½ years
Int. Cl. D23—*03*
U.S. Cl. D23—97



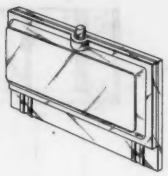
266,107
AIR FRESHNER OR SIMILAR ARTICLE
Georg Schimanski, Hagen, Fed. Rep. of Germany, assignor to Globol-Werk GmbH, Neuburg, Fed. Rep. of Germany
Filed Mar. 11, 1980, Ser. No. 129,491
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1979, 408
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

266,108
VENTILATING HOOD FOR AN ELECTROPLATING TANK
Steve A. Acero, 21089 Lavina Ct., Cupertino, Calif. 95014, and Edward L. Rougeau, 2592 Glade, Santa Clara, Calif. 95051
Filed Apr. 28, 1980, Ser. No. 144,265
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151

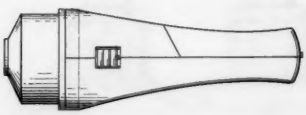


266,109
DENTAL SCALER
Anthony T. Sertich, New York, N.Y., and N. Dominic Marucci, Philadelphia, Pa., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Dec. 10, 1979, Ser. No. 101,608
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

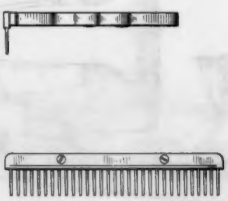
266,110
ELECTRIC DISCHARGE LAMP
Kazuo Ariga, Tokyo, and Mitunari Yoshida, Yokohama, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Dec. 4, 1979, Ser. No. 100,137
Claims priority, application Japan, Oct. 12, 1979, 54-42957
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3



266,111
PERSONAL CARE APPLIANCE
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Jun. 19, 1980, Ser. No. 161,016
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—58



266,112
ANIMAL COMB
Mickey D. Culp, R.R. 2, Box 65-B, Francesville, Ind. 47946
Filed Aug. 8, 1980, Ser. No. 176,393
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—40



266,113

SAFE

Dieter Eppler, Geesthacht, and Karl-Heinz Kremson, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

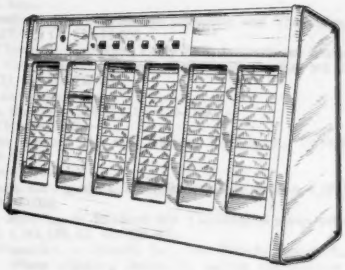
Filed Apr. 30, 1980, Ser. No. 145,044

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 10887

Term of patent 14 years

Int. Cl. D99—*00*

U.S. Cl. D99—28



266,114

MONEY CHEST

Johannes C. Berkheij, Driebergen, Netherlands, assignor to Metaalwarenfabriek Hoogmerk B.V., Netherlands

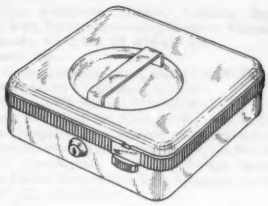
Filed Oct. 17, 1979, Ser. No. 85,727

Claims priority, application Benelux, Jul. 16, 1979, 53845-00

Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D99—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
McKelvy, Marvin D., 4,348,561, Cl. 200-51.00R.

A. Ott GmbH: *See*—
Claussen, Reimer; and Jung, Liebhard, 4,347,753, Cl. 74-110.000.

AB Asea-Atom: *See*—
Nylund, Olov, 4,348,355, Cl. 376-434.000.

AB CTC: *See*—
Hillerstrom, Bjorn; Fransson, Lennarth; and Thuvander, Arne, 4,347,972, Cl. 236-18.000.

Abbott, Clinton E.; and Rice, Larry J., to International Business Machines Corporation. Tabulation rack with spring pin holding. 4,348,123, Cl. 400-298.000.

Abbott Laboratories: *See*—
Chau, Kue H., 4,348,374, Cl. 424-1.000.

Abbott, Thomas P.: *See*—
Shasha, Baruch S.; and Abbott, Thomas P., 4,348,492, Cl. 524-52.000.

Abe, Seikou: *See*—
Nomura, Ken; Igashira, Toshihiko; and Abe, Seikou, 4,347,826, Cl. 123-549.000.

Acheson, John L., to Rexnord Inc. Convertible pump servo-valve control. 4,348,159, Cl. 417-220.000.

Achiha, Masahiko, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Phase adjusting system for carrier chrominance signal. 4,348,689, Cl. 358-31.000.

Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, to Ciba-Geigy Corporation. Pesticidal α-allenyl-3-phenoxybenzyl-2,2-dimethyl-3-(2,2-dihalovinyl)-cyclopropane-1-carboxylates. 4,348,408, Cl. 424-305.000.

Ackley, Donald E.; Engelmann, Reinhart W. H.; and Kerps, Dietrich, to Hewlett-Packard Company. Multiple stripe leaky mode laser. 4,348,763, Cl. 372-45.000.

Adachi, Mitsuji: *See*—
Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, 4,348,201, Cl. 8-94.180.

Adams, Gary V.: *See*—
Law, Bliss W.; Kirchoff, George F.; and Adams, Gary V., 4,348,037, Cl. 280-733.000.

Adams, Gerald M., to Orthotech, Incorporated. Orthopedic correctional support system. 4,347,840, Cl. 128-70.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,348,308, Cl. 524-110.000.

Adelphi Research Center, Inc.: *See*—
Wright, Donald G., 4,347,982, Cl. 239-405.000.

Adria Laboratories, Inc.: *See*—
Imondi, Anthony R.; and Shemano, Irving, 4,348,407, Cl. 424-300.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Scheerer, Rainer; Ranz, Erwin; and Lohmann, Joachim W., 4,348,474, Cl. 430-382.000.

Agfa-Gevaert Aktiengesellschaft AG: *See*—
Wernicke, Ubbo; and Meckl, Heinz, 4,348,475, Cl. 430-399.000.

Agfa-Gevaert N.V.: *See*—
Stievenart, Emile F.; Plessers, Hendrik S.; and Hellemans, Julianus J., 4,348,019, Cl. 271-10.000.

Ago, Nobuhiro: *See*—
Suzuki, Toyotosi; and Ago, Nobuhiro, 4,348,095, Cl. 354-288.000.

Agrawal, Giridhari L.; and Hockey, Edward J., to Garrett Corporation, The. Foil bearing mounting. 4,348,066, Cl. 308-9.000.

Ahlen, Karl G., to S.R.M. Hydromekanik Aktiebolag. Hydromechanical transmissions. 4,347,761, Cl. 74-732.000.

Ahlgren, Sture: *See*—
Skafvenstedt, Bengt; and Ahlgren, Sture, 4,348,118, Cl. 400-54.000.

Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground design kit and method of using the same. 4,348,188, Cl. 434-72.000.

Aihara, Hisamoto: *See*—
Suzuki, Suzuo; Nakagawa, Yasuhiko; Aihara, Hisamoto; and Matsumoto, Yasuo, 4,347,825, Cl. 123-537.000.

Ailin-Pyzik, Iris B.; and Falcone, James S., Jr., to PQ Corporation. Method for binding particulate materials. 4,347,890, Cl. 164-528.000.

Ainscow, Frank, to International Business Machines Corporation. Multibeam cathode ray tube apparatus. 4,348,688, Cl. 358-29.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kitamura, Kazuhiko, 4,347,699, Cl. 60-290.000.

Aisin Warner K.K.: *See*—
Sakakibara, Shiro; Tsukamoto, Kazumasa; Sakai, Takahiro; and Terakura, Yukio, 4,347,763, Cl. 74-789.000.

Aitcin, Pierre C.; Pinsonneault, Philippe; and Fortin, Roland, to Universite de Sherbrooke. Briquettes of silicon and ferrosilicon dust. 4,348,230, Cl. 75-129.000.

Akagami, Akira: *See*—
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.

Akagawa, Masaki: *See*—
Sugimoto, Osamu; and Akagawa, Masaki, 4,347,925, Cl. 194-1.00N.

Akebono Brake Industry Company, Ltd.: *See*—
Ogiwara, Osao, 4,348,490, Cl. 523-156.000.

Akerberg, Denis W.; Huffman, George W.; and Rude, Carl A., to Quaker Oats Company, The. Method and composition for a furan-modified phenolic novolak binder system. 4,348,343, Cl. 264-29.500.

Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, to Daikin Kogyo Co., Ltd. Apparatus for solid gas reaction. 4,348,363, Cl. 422-192.000.

Akutsu, Eiichi: *See*—
Kozima, Akio; Akutsu, Eiichi; and Ichizuka, Kiyomi, 4,348,470, Cl. 430-72.000.

AKZO nv: *See*—
Kelder, Jan, 4,348,390, Cl. 424-241.000.

Alanko, Allan M.; Marko, Ollie W.; Skinner, Charles E.; and Wood, Larry H., to Dow Corning Corporation. Monoorganosiloxy containing siloxane fluids. 4,348,532, Cl. 556-457.000.

Alanko, Allan M.; and Salverson, David R., to Dow Corning Corporation. Preparation of linear polydimethylsiloxanes. 4,348,533, Cl. 556-457.000.

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Staudenrausch, Georg, 4,347,646, Cl. 17-49.000.

Albertazzi, Gastone, to Finike Italiana Marposs S.p.A. Apparatus for the dimensional checking of a bearing ring. 4,347,667, Cl. 33-174.00L.

Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, to Ciba-Geigy AG; and Bayer Aktiengesellschaft. Process for producing the magnesium salt of 3-nitro-naphthalene-1,5-disulfonic acid (nitro-Armstrong's acid). 4,348,334, Cl. 260-505.00C.

Alcan Research and Development Limited: *See*—
O'Dette, John H.; and Jack, Stanton E., 4,348,242, Cl. 149-7.000.

Alco Standard Corporation: *See*—
Luebke, Clement J.; and Daniels, Lowell W., 4,347,833, Cl. 126-369.000.

Aldridge, Clyde L.: *See*—
Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., 4,348,270, Cl. 208-9.000.

Alekhin, Stanislav A.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Bakhir, Tatyana M., 4,347,736, Cl. 73-155.000.
Tikhonov, Jury P.; Alekhin, Stanislav A.; Bakhir, Vitold M.; and Zadorozhny, Jury G., 4,348,279, Cl. 210-96.100.

Alig, Leo: *See*—
Nickolson, Robert; Kerb, Ulrich; Wiechert, Rudolf; Alig, Leo; Furst, Andor; and Muller, Marcel, 4,348,327, Cl. 260-397.100.

Allen, Bert L.; Wourms, Robert L.; and Hu, Daniel C., to National Semiconductor Corporation. Method of fabricating a high-frequency bipolar transistor structure utilizing permeation-etching. 4,347,654, Cl. 29-576.00B.

Allflex International Limited: *See*—
Scott, Michael J., 4,347,868, Cl. 137-462.000.

Allgaier, Juergen: *See*—
Werner, Arnold; Ennen, Peter; Nuebauer, Josef; Flaig, Hans; and Allgaier, Juergen, 4,348,753, Cl. 368-188.000.

Allied Chemical Corporation: *See*—
Chakravarti, Kalidas, 4,348,517, Cl. 523-425.000.

Allied Corporation: *See*—
Lazarus, Stanley D.; and Lofquist, Robert A., 4,348,314, Cl. 525-439.000.

Alpha Industries, Inc.: *See*—
Reid, Martin J., 4,348,651, Cl. 333-262.000.

Alps Electric Co., Ltd.: *See*—
Ushida, Susumu; and Yanagida, Hiroyuki, 4,348,645, Cl. 330-306.000.

Alter, William F.; DeBoer, Jonathan J.; and Shellenberger, Charles R., to Square D Company. Screw orienter. 4,347,926, Cl. 198-388.000.

Aluminum Company of America: *See*—
Hines, James E., Jr.; and LaBar, Richard G., deceased, 4,348,236, Cl. 106-38.270.

Alyfuku, Kiyoshi: *See*—
Katsuma, Makoto; Shinbori, Kenichi; Kiuchi, Masayoshi; and Alyfuku, Kiyoshi, 4,348,096, Cl. 354-289.000.

American Can Company: *See*—
Pauls, Walter L.; and Dunleavy, Raymond A., III, 4,348,251, Cl. 156-500.000.

American Cyanamid Company: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,348,527, Cl. 548-362.000.
Loffelman, Frank F., 4,348,493, Cl. 524-100.000.
Rickelton, William A.; Robertson, Allan J.; and Burley, David R., 4,348,367, Cl. 423-139.000.
Shepherd, Robert G., 4,348,399, Cl. 424-263.000.

American Home Products Corporation: *See*—
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,348,413, Cl. 424-322.000.

American Hospital Supply Corporation: *See*—
Gammons, Clifford E.; Moore, Francis C.; Pagel, Kenneth L.; and Jackson, Barry N., 4,347,633, Cl. 5-453.000.

American Monitor Corporation: *See*—
Long, Robert L., 4,348,208, Cl. 23-230.00B.

American Standard Inc.: *See*—
Molina, Joao F. G., 4,348,175, Cl. 432-241.000.
Strobel, Richard A.; and Lyons, Michael D., 4,347,869, Cl. 137-488.000.

Ampex Corporation: *See*—
Haynes, David L.; and Brennan, John M., 4,348,754, Cl. 369-60.000.

Analtech, Incorporated: *See*—
Felton, Herman R., 4,348,286, Cl. 210-658.000.

Ancher, Jean-Francois R.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,348,393, Cl. 424-248.570.

Anderl, Peter; and Monch, Clauspeter, to Steigerwald Strahltechnik GmbH. Position regulation of a charge carrier beam. 4,348,576, Cl. 219-121.0EW.

Anderson, Harold M.; Marcum, Norman E.; and DuVall, Wilbur E., to Xerox Corporation. Thermal servo system for mechanical positioning. 4,348,624, Cl. 318-634.000.

Anderson, Ronald L. Apparatus for traversing a terrain in a predetermined pattern. 4,347,908, Cl. 180-131.000.

Andren, Carl F.: *See*—
Scott, Lex A.; Mosley, William H., Jr.; and Andren, Carl F., 4,348,641, Cl. 329-50.000.

Andrews, Merritt B., to United Technologies Corporation. Blade pitch actuation system. 4,348,156, Cl. 416-48.000.

ANIC, S.p.A.: *See*—
Priola, Aldo; and Giuliani, Giampaolo, 4,348,427, Cl. 427-44.000.

Anthony, Richard A.: *See*—
Le Tarte, Walter, 4,347,639, Cl. 15-21.00D.

Anzai, Kuniaki: *See*—
Tateishi, Kazushi; Anzai, Kuniaki; and Tomita, Taketoshi, 4,348,276, Cl. 209-573.000.

Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, to Kobe Steel, Ltd. Direct reduction process for producing metallic iron. 4,348,226, Cl. 75-35.000.

Arai, Hirotake; and Arai, Michio. Fastener for helmet jaw band. 4,347,630, Cl. 2-421.000.

Arai, Michio: *See*—
Arai, Hirotake; and Arai, Michio, 4,347,630, Cl. 2-421.000.

Ardac, Inc.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,348,656, Cl. 340-146.30R.

Ardito, Francesco, to Calzaturificio "Plastica Excelsior" di Francesco Ardito. Manufacturing process of sandals and clogs with plastic soles and shoes manufactured through this process. 4,347,637, Cl. 12-142.00S.

Argazzi, Dennis J.; and Burger, Robert, to Loctite Corporation. Liquid dispensing apparatus. 4,347,806, Cl. 118-710.000.

Arledge, Arthur L.: *See*—
Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., 4,348,738, Cl. 364-900.000.

Armond, John W., to BOC Limited. Process for the separation of a gaseous mixture. 4,348,213, Cl. 55-25.000.

Armstrong World Industries, Inc.: *See*—
Herweh, John E.; Garrett, Thomas B.; and Magnusson, Alan B., 4,348,508, Cl. 526-268.000.
Miller, Jesse D., Jr.; and Petzold, James R., 4,348,447, Cl. 428-149.000.

Arndt, Walter E. Foot steering apparatus for outboard motor boats. 4,348,193, Cl. 440-62.000.

Arnould, Jacques, to Le Silicium Semiconducteur SSC. Process for mounting a protection diode on a vertical multijunction photovoltaic cell structure and photovoltaic cells obtained. 4,348,545, Cl. 136-244.000.

Arrison, Frank J.: *See*—
Mittal, Faquir C.; Arrison, Frank J.; and Schonfeld, Arnold, 4,348,705, Cl. 360-98.000.

Artaud, Robert; Aubert, Michel; Elbeze, Richard; and Jogand, Patrick, to Commissariat a l'Energie Atomique. Semi-modular heat exchanger for nuclear reactors. 4,348,354, Cl. 376-405.000.

Arvin Industries, Inc.: *See*—
Cauldwell, Jack D., 4,348,693, Cl. 358-140.000.

Asahi Glass Company, Ltd.: *See*—
Oohasi, Koji; Hosoda, Yutaka; Kitamura, Toshio; and Kudo, Eiichi, 4,348,485, Cl. 501-115.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Shindow, Osamu, 4,348,108, Cl. 356-125.000.

Asahi Kogalu Kogyo Kabushiki Kaisha: *See*—
Ogawa, Ryota, 4,348,082, Cl. 350-423.000.

ASEA Aktiebolag: *See*—
Johansson, Folke, 4,348,558, Cl. 200-6.00R.
Torok, Vilmos, 4,348,605, Cl. 310-168.000.

Ash, Stephen R., to Purdue Research Foundation. Reciprocating dialyzer having spacers. 4,348,283, Cl. 210-321.300.

Ashland Oil, Inc.: *See*—
Shields, Theodore C., 4,348,523, Cl. 544-399.000.

Asmuth, Richard L., to Bell Telephone Laboratories, Incorporated. Method of providing virtual private network telephone service. 4,348,554, Cl. 179-18.00B.

Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, to Kraftwerk Union Aktiengesellschaft; and Reaktor-Brennelement Union GmbH. Method for manufacturing oxidic nuclear fuel bodies. 4,348,339, Cl. 264-0.500.

Association des Ouvriers en Instruments de Precision: *See*—
David, Roger J. P.; and Lande, Maurice A., 4,348,634, Cl. 323-353.000.

Astec Industries, Inc.: *See*—
Brock, J. Donald, 4,348,146, Cl. 414-332.000.

Atherton, James H.; and Jindra, Clifford P., to RCA Corporation. Signal comparison circuit. 4,348,596, Cl. 307-264.000.

Atkinson, Joseph G.; and Wasson, Burton K., to Merck Sharp & Dohme (I.A.) Corp. Quinolinyl ethanolamines. 4,348,398, Cl. 424-258.000.

Aubert, Michel: *See*—
Artaud, Robert; Aubert, Michel; Elbeze, Richard; and Jogand, Patrick, 4,348,354, Cl. 376-405.000.

Audio in Motion: *See*—
Bertagna, Richard A.; Stansbury, Benjamin H.; and Tarlow, Kenneth A., 4,347,911, Cl. 181-130.000.

Auerbach, Robert A.: *See*—
Blenner, Donald R.; Auerbach, Robert A.; and Boenig, Herman V., 4,348,426, Cl. 427-41.000.

Auterson, James, to Marconi Company Limited, The. Sights. 4,348,109, Cl. 356-252.000.

AVX Corporation: *See*—
Mc Larney, Joseph C.; and Lightweis, David J., 4,347,650, Cl. 29-25.420.

B & J Manufacturing Company: *See*—
Parenti, Joseph A.; and Charles, Malcolm J. (said Malcolm Jean Charles assors. to), 4,348,057, Cl. 299-12.000.

Baba, Masanori; and Hara, Toshito, to Fujitsu Limited. Rhodium electrical contact of a switch particularly a reed switch. 4,348,566, Cl. 200-144.00B.

Bachman, Gerald L., to Monsanto Company. Recovery of L-phenylalanine and L-aspartic acid during preparation of α-L-aspartyl-L-phenylalanine methyl ester. 4,348,317, Cl. 260-112.50R.

Bachmann, Andrew G. Adhesive composition. 4,348,503, Cl. 525-455.000.

Bachmann, Rainer, to Black & Decker Inc. Cutterhead for a power planer. 4,347,882, Cl. 144-225.000.

Backman, Bo G., to Linden-Alimak AB. Apparatus for separating fine material from coarse material. 4,348,275, Cl. 209-310.000.

Bair, Scott S., III, to Singer Company, The. Power assist drive upright vacuum cleaner and power assist drive system therefor. 4,347,643, Cl. 15-340.000.

Baker, James K.; and Baker, Janet M., to International Business Machines Corporation. Parallel pattern verifier with dynamic time warping. 4,348,553, Cl. 179-1.0SB.

Baker, Janet M.: *See*—
Baker, James K.; and Baker, Janet M., 4,348,553, Cl. 179-1.0SB.

Bakhir, Tatyana M.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Bakhir, Tatyana M., 4,347,736, Cl. 73-155.000.

Bakhir, Vitold M.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Bakhir, Tatyana M., 4,347,736, Cl. 73-155.000.
Tikhonov, Jury P.; Alekhin, Stanislav A.; Bakhir, Vitold M.; and Zadorozhny, Jury G., 4,348,279, Cl. 210-96.100.

Balaban, John A. Racket stringing apparatus and method. 4,348,024, Cl. 273-73.00A.

Baldwin, Mark H., to NesTier Corporation. Shelf support bracket. 4,348,001, Cl. 248-243.000.

Balta, Justin O.; and Nelson, Edward I. Shift lock and positior indicating torsion spring activated key switch. 4,348,122, Cl. 400-276.000.

Baran, Rowland S.: *See*—
Gamble, James R.; Herrold, Lear C.; and Baran, Rowland S., 4,348,176, Cl. 432-258.000.

Barger, John J.; and Underwood, James R., to Combustion Engineering, Inc. Flux dam for submerged arc welding. 4,348,574, Cl. 219-73.210.

Barlow, Gordon A., to Gordon Barlow Design. Board game with random water distribution for dunking playing pieces. 4,348,028, Cl. 273-249.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Pieper, Werner; and Worpenberg, Reinhard, 4,347,989, Cl. 242-35.50R.

Barnes, Philip E.; Mayo, Millard G.; and Sherman, Robert, to United Technologies Corporation. Wind turbine blade pitch control system. 4,348,155, Cl. 416-46.000.

Barnes, Robert R.; and Myers, Charles L., to Barnes, Robert R. Driver alert system. 4,348,652, Cl. 340-52.00R.

Barrera, Giorgio, to Officine Meccaniche Pavesi & C. S.p.A. Method for the insertion of pre-wound coils into stator slots. 4,347,657, Cl. 29-596.000.

Barrett, Edward J. Interlocking molecular model system. 4,348,190, Cl. 434-278.000.

Barrington, Burchus Q., to Halliburton Company. Hydraulic connector apparatus and method. 4,347,900, Cl. 166-380.000.

Bartolomucci, John R.: *See*—
Bertolucci, Michael D.; and Bartolomucci, John R., 4,348,491, Cl. 523-214.000.

Barton, Edwin A.: *See*—
Jernberg, Robert H.; and Barton, Edwin A., 4,347,942, Cl. 220-89.00A.

BASF Aktiengesellschaft: *See*—
Husslein, Gerd; and Hamprecht, Gerhard, 4,348,534, Cl. 560-62.000.
Ilmer, Andreas, 4,348,692, Cl. 358-127.000.
Schomann, Klaus D., 4,348,698, Cl. 360-14.000.

BASF Wyandotte Corporation: *See*—
Patil, Arvind S.; Kersten, Siegfried P.; and Fliege, Werner P., 4,348,240, Cl. 106-304.000.

Basle, Andrew G. Telephone with long distance dialing lock out. 4,348,555, Cl. 179-90.00D.

Bastian, Franklin E.: *See*—
Schonfeld, Arnold; Eibner, Jules A.; and Bastian, Franklin E., 4,348,101, Cl. 355-14.00R.

Bauer, Kurt; and Roth, Christian, to ITT Industries, Inc. Wiper arm. 4,347,642, Cl. 15-250.350.

Bauer, Peter. Elastomer bulb dispensing pump. 4,347,953, Cl. 222-207.000.

Bauer, Wolfgang; Dickmanns, Heinz; Morgenroth, Konstantin; Reh, Kuno; and Ribka, Joachim, to Cassella Aktiengesellschaft. Aqueous dyestuff formulation, a process for its preparation and its use for dyeing and printing. 4,348,204, Cl. 8-527.000.

Bauman, William C.; Lee, John M.; and Burba, John L., III, to Dow Chemical Company, The. Crystalline lithium aluminates. 4,348,296, Cl. 252-184.000.

Bauman, William C.; and Lee, John M., to Dow Chemical Company, The. Crystalline lithium aluminates. 4,348,297, Cl. 252-184.000.

Baxter, David H. Motorcycle jack. 4,348,010, Cl. 254-131.000.

Baxter Travenol Laboratories, Inc.: *See*—
George, Richard W.; and Schnell, William J., 4,348,280, Cl. 210-101.000.
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,348,209, Cl. 23-232.00R.

Bayer Aktiengesellschaft: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, 4,348,334, Cl. 260-505.00C.
Blahak, Johannes; Hubner, Hans; Koster, Johannes; Meiners, Hans J.; and Thomas, Heinz, 4,348,536, Cl. 560-169.000.
Blank, Heinz U.; Behre, Horst; and Linden, Hans W., 4,348,336, Cl. 260-508.000.
Buysch, Hans-Josef; Brassat, Bert; Eimers, Erich; and Hermann, Karl H., 4,348,495, Cl. 524-117.000.
Dickore, Karlfried; and Kuhle, Engelbert, 4,348,331, Cl. 260-465.00D.
Franckowiak, Gerhard; Meyer, Horst; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,348,395, Cl. 424-250.000.
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.
Grogler, Gerhard; and Meyborg, Holger, 4,348,512, Cl. 528-73.000.
Hamprecht, Rainer, 4,348,319, Cl. 260-208.000.
Kinast, Gunther; Muller, Lutz; Sitt, Rudiger; and Puls, Walter, 4,348,402, Cl. 424-267.000.
Kuhle, Engelbert; Kraus, Peter; and Klauke, Erich, 4,348,411, Cl. 424-319.000.
Linhart, Karl; Pawellek, Dieter; and Gleinig, Harald, 4,348,335, Cl. 260-508.000.
Lobach, Wilfried; Kolb, Gunter; Lehmann, Wolfgang; Cramm, Gunther; Muller, Friedhelm; and Muszik, Janos, 4,348,514, Cl. 528-367.000.
Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; Gallenkamp, Bernd; and Klauke, Erich, 4,348,538, Cl. 562-459.000.
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,348,332, Cl. 260-502.40R.
Serini, Volker; Neumann, Rainer; Friedhofen, Gerhard; Freitag, Dieter; Heuser, Jurgen; and Schwarz, Hans-Helmut, 4,348,542, Cl. 568-727.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,348,394, Cl. 424-248.570.

BBC Brown, Boveri & Company: *See*—
Muller, Rene, 4,348,268, Cl. 204-290.00R.

BBC Brown, Boveri & Co. Ltd.: *See*—
Bezencon, Jean-Jacques, deceased; Menzi, Georges; and Mermoud, Lucien, 4,347,918, Cl. 192-0.02R.
Schmidt, Walter, 4,348,255, Cl. 156-656.000.

Beach, Kenneth A., to Ford Motor Company. High temperature outdoor weathering chamber. 4,347,737, Cl. 73-159.000.

Beale, Mark. Disposable electrical surgical suction tube and instrument. 4,347,842, Cl. 128-276.000.

Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., to Exxon Research And Engineering Co. Catalysts and hydrocarbon treating processes utilizing the same. 4,348,270, Cl. 208-9.000.

Beaver, Perry L.: *See*—
Rode, Heinz A.; Fromel, Meter; and Beaver, Perry L., 4,348,665, Cl. 340-682.000.

Becher, Albert P.: *See*—
King, Paul V.; Becher, Albert P.; and Henderson, Wilmer P., 4,347,796, Cl. 109-49.500.

Bechtel International Corporation: *See*—
Sandhu, Avtar S., 4,348,206, Cl. 23-230.00A.

Becker, Herbert; and Tischler, Josef, to Metallwerk Max Brose GmbH & Co. Window lifter. 4,347,755, Cl. 74-421.00A.

Behre, Horst: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, 4,348,334, Cl. 260-505.00C.
Blank, Heinz U.; Behre, Horst; and Linden, Hans W., 4,348,336, Cl. 260-508.000.

Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.

Behringwerke Aktiengesellschaft: *See*—
Bohn, Hans, 4,348,316, Cl. 260-112.00R.

Beier, Galen C. Television viewing control device. 4,348,696, Cl. 358-188.000.

Belart, Juan, to ITT Industries, Inc. Vacuum brake booster. 4,347,779, Cl. 91-369.00A.

Bell Telephone Laboratories, Incorporated: *See*—
Asmuth, Richard L., 4,348,554, Cl. 179-18.00B.
Blahut, Donald E.; Huang, Victor K.; and Townsend, Richard L., Jr., 4,348,720, Cl. 364-200.000.
Draper, Clifton W.; and Sharma, Satya P., 4,348,263, Cl. 204-29.000.
Hertz, David; Kurshan, Robert P.; and Malah, David, 4,348,735, Cl. 364-724.000.
Leland, Kenneth W.; and Sollenberger, Nelson R., 4,348,772, Cl. 455-260.000.
McIntyre, James D. E., 4,348,078, Cl. 350-357.000.
Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,348,550, Cl. 179-1.0SD.
Smith, George E.; and Strain, Robert J., 4,347,656, Cl. 29-591.000.

Bendix Corporation, The: *See*—
Casey, Gary L., 4,347,822, Cl. 123-445.000.
Koenig, James P., 4,348,062, Cl. 303-6.00C.
Martin, Michael D., 4,347,757, Cl. 74-493.000.

Beneteau, Charles, to Patrick S.A. Mold for the production of spiked soles for sport shoes. 4,348,003, Cl. 249-96.000.

Bennett, Robert B., to Dow Chemical Co., The. Insulated tank. 4,347,949, Cl. 220-415.000.

Bennett, William G.; and Spease, Arthur L., to Teleflex Incorporated. Method for making a remote control assembly with vibration dampener. 4,348,348, Cl. 264-255.000.

Benson, John T., to Mattel, Inc. Split tubular member for coupling a tonearm to a speaker cone. 4,348,755, Cl. 369-155.000.

Benton, Ronald; Kidder, Kenneth B.; Linderberg, Robert L.; Tinsley, Timothy M.; and Westley, Curtis E., to Honeywell Inc. Microprocessor discharge temperature air controller for multi-stage heating and/or cooling apparatus and outdoor air usage controller. 4,347,712, Cl. 62-175.000.

Benyo, Janos; Papp, Tibor; and Tolnay, Janos, to Human Oltoanyagtermelo es Kutato Intezet. Biological wound covering and method for producing same. 4,347,841, Cl. 128-156.000.

Berckes, David H. Test weight scale. 4,347,905, Cl. 177-149.000.

Berger, James K., to Pioneer Research, Inc. Portable field test unit for computer data and program storage disc drive. 4,348,761, Cl. 371-21.000.

Berger, Rosemary K. Hearing air sheath and body harness. 4,347,956, Cl. 224-202.000.

Bergey, James L.: *See*—
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,348,413, Cl. 424-322.000.

Berghmans, Jacques M. L., to Du Pont de Nemours, E. I., and Company. Acrylic resin with antiplasticizer. 4,348,497, Cl. 524-293.000.

Bergholz, Helmut; and Tams, Walter, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Connecting device, preferably for sheet metal components of light metal allows. 4,348,140, Cl. 411-103.000.

Bergstrom, John R.; and Haggstrom, Sten L., to Mo och Domsjo Aktiebolag. Process for controlling the supply of delignifying and/or bleaching chemicals in the continuous delignification of lignocellulosic material. 4,348,256, Cl. 162-49.000.

Berlant, Emmanuel. Loudspeaker system. 4,348,549, Cl. 179-1.00E.

Bernstein, Seymour: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,348,527, Cl. 548-362.000.

Bertagna, Richard A.; Stansbury, Benjamin H.; and Tarlow, Kenneth A., to Audio in Motion. Acoustic headset. 4,347,911, Cl. 181-130.000.

Bertagnoli, Leopoldo, to Officine Savio S.p.A. Circular knitting machines for knitting articles of terry fabric. 4,347,719, Cl. 66-91.000.

Bertolucci, Michael D.; and Bartolomucci, John R., to General Electric Company. Heat stable molded phenolic resin article. 4,348,491, Cl. 523-214.000.

Bertus, Brent J.: *See*—
Roberts, John S.; Bertus, Brent J.; and McKay, Dwight L., 4,348,304, Cl. 252-455.00Z.

Besslein, Wulf, to Daimler-Benz Aktiengesellschaft. Prechamber for an air-compressing injection internal combustion engine. 4,347,814, Cl. 123-261.000.

Betensky, Ellis I., to U.S. Precision Lens Inc. Projection lens. 4,348,081, Cl. 350-412.000.

Bezencon, Jean-Jacques, deceased (by Bezencon, Madeleine, Corinne Bezencon and Serge Bezencon, heirs); Menzi, Georges; and Mermoud, Lucien, to BBC Brown, Boveri & Co. Ltd. Drive device for a vehicle. 4,347,918, Cl. 192-0.02R.

Bezencon, Madeleine, Corinne Bezencon and Serge Bezencon, heirs: *See*—
Bezencon, Jean-Jacques, deceased; Menzi, Georges; and Mermoud, Lucien, 4,347,918, Cl. 192-0.02R.

Bhattacharyya, Sushantha K.: *See*—
El-Menshawy, Mohamed F.; Woodrow, Peter A.; and Bhattacharyya, Sushantha K., 4,348,573, Cl. 219-69.00M.

Bhatti, Mohinder S.; and Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass fibers. 4,348,216, Cl. 65-1.000.

Big Inch Marine Systems, Inc.: *See*—
Miller, Jack E., 4,348,039, Cl. 285-1.000.

Bijttebier, Gaspar A. H.; and Vangheluwe, Jozef, to Bijttebier, Gaspar A. H. Method and apparatus for the separation of flexible sheets from a stack and their transportation to a processing unit. 4,348,018, Cl. 271-10.000.

Billig, Ernst; Jamerson, Jackie D.; and Pruett, Roy L., to Union Carbide Corporation. Heteronuclear-bridged rhodium clusters. 4,348,539, Cl. 568-454.000.

Billing, Lars J. T. Hydraulic nailing machine. 4,347,963, Cl. 227-8.000.

Binder, Jean-Jacques, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Device for removing excess pigment from the surface of the image carrier of a non-impact printing machine. 4,348,684, Cl. 346-153.100.

Birbara, Philip J., to United Technologies Corporation. Catalyst for hydrazine decomposition. 4,348,303, Cl. 252-447.000.

Bithell, Roger M., to Motorola, Inc. Plasma pressure pulse sterilization. 4,348,357, Cl. 422-22.000.

Black & Decker Inc.: *See*—
Bachmann, Rainer, 4,347,882, Cl. 144-225.000.
Huber, Siegfried, 4,348,603, Cl. 310-50.000.

Blahak, Johannes; Hubner, Hans; Koster, Johannes; Meiners, Hans J.; and Thomas, Heinz, to Bayer Aktiengesellschaft. Odorless catalysts for the synthesis of polyurethanes. 4,348,536, Cl. 560-169.000.

Blahut, Donald E.; Huang, Victor K.; and Townsend, Richard L., Jr., to Bell Telephone Laboratories, Incorporated. Microcomputer arranged for direct memory access. 4,348,720, Cl. 364-200.000.

Blampain, Guy; and Grandfils, Pierre, to Charbonnages de France. Sliding supporting gallery. 4,348,138, Cl. 405-297.000.

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Rockley, Mark G.; and Mains, Gilbert J., 4,348,428, Cl. 427-54.100.

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Armond, John W., 4,348,213, Cl. 55-25.000.

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Friebe, Walter-Gunar; Kampe, Wolfgang; Thiel, Max; Schaumann, Wolfgang; and Wilhelms, Otto-Henning, 4,348,401, Cl. 424-267.000.

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Cannon, Michael R.; Fuller, Robert L., Jr.; and Proff, Dwayne E., 4,347,660, Cl. 29-790.000.
Loree, Thomas J., 4,347,998, Cl. 248-68.00R.

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Neale, Denis M.; Bontoft, Frederick J.; and Ikin, John B., 4,348,114, Cl. 356-431.000.

Bookout, Floyd V., to Rock-Ola Manufacturing Corporation. Serpentine magazine for can venders. 4,347,952, Cl. 221-129.000.

Booth, Peter L.: *See*—
Newton, Barrie H.; Booth, Peter L.; and Davies, Robert, 4,348,646, Cl. 331-77.000.

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Bordes, Alain, to SKF Compagnie d'Applications Mecaniques. Freewheel or unidirectional clutch. 4,347,921, Cl. 192-41.00A.

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Fehlau, Rudolf, 4,347,945, Cl. 220-327.000.
Holdeman, John W., 4,347,762, Cl. 74-788.000.
Lamarche, Paul E., 4,347,717, Cl. 464-64.000.
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Hanson, Larry K.; and Bosdachin, Silvano A., 4,348,032, Cl. 277-235.00B.

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Franckowiak, Gerhard; Meyer, Horst; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,348,395, Cl. 424-250.000.

Boucher, Guy, to La Telemecanique Electrique. Seat with adjustable foot-rest. 4,348,051, Cl. 297-423.000.

Bouffard, F. Aileen; Christensen, Burton G.; and Johnston, David B. R., to Merck & Co., Inc. Substituted azetidiones. 4,348,320, Cl. 260-239.00A.

Bouillon, Claude; and Maignan, Jean, to L'Oreal. Dithioether-based cosmetic compositions for the treatment of the oily state of hair and skin. 4,348,383, Cl. 424-70.000.

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Bourns Instruments, Inc.: *See*—
Singh, Gurnam, 4,347,745, Cl. 73-721.000.

Bouteille, Daniel; Nicolas, Michel; and Prudhomme, Pierre, to La Telemecanique Electrique. Auxiliary control device for pneumatic distributor. 4,347,864, Cl. 137-269.000.

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Bowden, Wade R., Jr., to Slater Electric Inc. Electrical outlet box with recessed ports. 4,348,547, Cl. 174-65.00R.

Bowling, James T., to J. Connell Associates. Wheel cover retention. 4,348,061, Cl. 301-37.00R.
Bowser, George H.: *See*—
Mistrick, George R.; Bowser, George H.; and Mazzoni, Renato J., 4,348,435, Cl. 428-34.000.
Bracco Industria Chimica S.p.A.: *See*—
Felder, Ernst; and Pitre, Davide, 4,348,377, Cl. 424-5.000.
Bradlee, Charles R., to Monarch Machine Tool Company, The. Method and apparatus for tensioning metallic strips on a slitting line. 4,347,723, Cl. 72-130.000.
Bradley, John J., to Paper Converting Machine Company. Apparatus for sharpening a disc. 4,347,771, Cl. 83-174.000.
Bradley, Robert C.: *See*—
Peer, George J.; and Bradley, Robert C., 4,348,284, Cl. 210-486.000.
Brandau, Egbert: *See*—
Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, 4,348,339, Cl. 264-0.500.
Brandt, Gerald B.: *See*—
Gottlieb, Milton; and Brandt, Gerald B., 4,348,075, Cl. 350-96.130.
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Brennan, John M.: *See*—
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Bretagne ACB Corporation: *See*—
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Bridgeman, Gerald L. Launcher for flying discs. 4,347,828, Cl. 124-5.000.
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Matsuda, Akira; Hayakawa, Yoshihiro; Yasuda, Shigeo; and Iwasaki, Motoaki, 4,348,654, Cl. 340-58.000.
Bright, David R.: *See*—
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Skelly, James K.; Evans, David G.; and Broadbent, Barrie, 4,348,203, Cl. 8-501.000.
Brock, J. Donald, to Astec Industries, Inc. Self-erecting surge bin. 4,348,146, Cl. 414-332.000.
Bromley, Harold, to Masson Scott Thrissell Engineering. Single facer for making single faced corrugated material. 4,348,250, Cl. 156-473.000.
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Greup, Dirk H.; and Brouwer, Willem, 4,348,417, Cl. 426-19.000.
Brown, A. Dix: *See*—
Williams, Glenn L.; Brown, A. Dix; and Reilly, Edward J., 4,348,667, Cl. 340-753.000.
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Brown, Gary G., to United States of America, Navy. Stretch-staging of resin-based fiber-impregnated tape. 4,348,347, Cl. 264-231.000.
Brown, Lawrence P. Thermal shutters. 4,347,887, Cl. 160-368.00R.
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Williamson, Kenneth T., Jr.; Bruce, Samuel S., Jr.; and Martin, Walter L., Jr., 4,348,217, Cl. 65-2.000.
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Hubbard, Vance M.; and Brunson, Welton K., 4,347,848, Cl. 128-402.000.
Brunswick Corporation: *See*—
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Bube, Carsten; T[illegible]le, Gerd; and Zeller, Hans, to Robert Bosch GmbH. Rapidly-heated periodically-maintained heater for motor vehicle apparatus. 4,348,583, Cl. 219-497.000.
Buchanan, Steven O., to Dwyer Instruments, Inc. Diaphragm type differential pressure gauge with overpressure relief protection. 4,347,744, Cl. 73-715.000.
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Budek, Jerzy A., to Texas Instruments Incorporated. Communication via an electricity supply main. 4,348,582, Cl. 219-483.000.
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Scheuchzer, Fredy; and Buhler, Fritz, 4,347,688, Cl. 51-178.000.
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Woltman, John; Zarfos, Donald W.; and Bulger, Robert F., deceased, 4,347,856, Cl. 131-105.000.
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Argazzi, Dennis J.; and Burger, Robert, 4,347,806, Cl. 118-710.000.
Burgess, David. Non-light producing substitute apparatus for use in place of phosphor excitable lamps. 4,348,614, Cl. 315-189.000.
Burke, Joseph D.: *See*—
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Caras, Bernard, 4,347,873, Cl. 140-71.500.
Fasig, Harold A., 4,347,936, Cl. 209-3.300.
Bussjager, Rudy C., to Carrier Corporation. Makeup air preconditioner for use with an air conditioning unit. 4,347,708, Cl. 62-95.000.
Butler, Melvyn P. Method of making forms for investment casting and products produced therefrom. 4,347,888, Cl. 164-34.000.
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Schipper, Hendricus H., 4,348,290, Cl. 210-783.000.
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Goedemans, Wilhelmus T., 4,348,375, Cl. 424-1.000.
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Fries, Ortwin; and Luhring, Claus, 4,348,282, Cl. 210-242.300.
Caccia, Carl. Settlement tank condition monitoring system. 4,348,278, Cl. 210-86.000.
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Jones, Marvin R., 4,347,898, Cl. 166-55.000.
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Wood, Arthur D., 4,347,686, Cl. 47-73.000.
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Hirohata, Michio; and Sugitani, Hirosi, 4,348,094, Cl. 354-234.000.
Katsuma, Makoto; Shinbori, Kenichi; Kiuchi, Masayoshi; and Alyfuku, Kiyoshi, 4,348,096, Cl. 354-289.000.
Kitagishi, Nozomu; and Fujibayashi, Kazuo, 4,348,084, Cl. 350-454.000.
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Canterino, Peter J., to Mobil Oil Corporation. Process for preparation of improved shrink wrap. 4,348,438, Cl. 428-36.000.

Cappel, Leona R., to Cooper Laboratories, Inc. Method and means for determination of pregnancy. 4,348,207, Cl. 23-230.00B.

Caprari, Fausto, to RCA Corporation. Radiation shadow projection exposure system. 4,348,105, Cl. 355-67.000.

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Carman, Kenneth K.; and Webb, Stanley G., to Koppers Company, Inc. Gear type coupling with overload protection. 4,347,715, Cl. 464-32.000.

Carmer, Richard V.: *See*—
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Carmo, Robert A.: *See*—
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Caroleo, Steven J.: *See*—
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Carson, Andrew B., Jr.; and Hanger, William A., to General Electric Company. Bounce control system for moving coil printing element. 4,348,119, Cl. 400-121.000.

Carter, Ernest A., to Motorola, Inc. Analog-to-digital converter using half range technique. 4,348,658, Cl. 340-347.0AD.

Carter, Michael C.: *See*—
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Casey, Gary L., to Bendix Corporation, The. Single point fuel injection with venturi atomization. 4,347,822, Cl. 123-445.000.

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Caterpillar Tractor Co.: *See*—
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Pradere, Francois; and Frey, Robert, 4,348,599, Cl. 307-426.000.

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Cespon, Manuel, to Ciba-Geigy Corporation. Coating compositions for the production of a recording material. 4,348,234, Cl. 106-21.000.

Chai, Thomas Y.: *See*—
Wu, M. T.; and Chai, Thomas Y., 4,347,709, Cl. 62-140.000.

Chakravarti, Kalidas, to Allied Chemical Corporation. Process and finish composition for producing adhesive active polyester yarn. 4,348,517, Cl. 523-425.000.

Chambers, Walter S.: *See*—
Harvey, James F.; Chambers, Walter S.; and Kulik, John J., 4,348,186, Cl. 434-44.000.

Chambers, William I., to NCR Corporation. Ball bearing slide. 4,348,063, Cl. 308-3.800.

Champion International Corporation: *See*—
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Thompson, Kenneth P., 4,348,346, Cl. 264-146.000.

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Blampain, Guy; and Grandfils, Pierre, 4,348,138, Cl. 405-297.000.

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Chase, Bryan B.; and Yi, Alberto, to Crosfield Electronics Limited. Engraving printing cylinders. 4,347,785, Cl. 101-1.000.

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Grossman, Gershon; Sivan, Gideon; Chefner, Tudor; and Matania, Eliyahu, 4,347,965, Cl. 228-107.000.

Chevron Research Company: *See*—
Kobzina, John W., 4,348,222, Cl. 71-118.000.
Simic, Milutin, 4,348,233, Cl. 106-18.230.

Chiba, Yochiteru: *See*—
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yochiteru; Kanno, Masayoshi; Kuniya, Jiro; and Itow, Hisao, 4,348,041, Cl. 285-286.000.

Chicago Pneumatic Tool Company: *See*—
Wallace, William K.; and Giardino, David A., 4,347,902, Cl. 173-93.500.

Childs, Richard B., to Optical Information Systems, Inc. Transient suppression circuit. 4,348,648, Cl. 372-29.000.

Chloride Group Limited: *See*—
Ray, William F.; and Davis, Rex M., 4,348,619, Cl. 318-139.000.

Chloride Silent Power Limited: *See*—
Wright, Michael L., 4,348,467, Cl. 429-94.000.
Wright, Michael L., 4,348,468, Cl. 429-193.000.

Chorvat, Robert J., to G.D. Searle & Co. 25-Substituted-5α-cholestane-3β,22S-diol. 4,348,328, Cl. 260-397.200.

Christensen, Burton G.: *See*—
Bouffard, F. Aileen; Christensen, Burton G.; and Johnston, David B. R., 4,348,320, Cl. 260-239.00A.

Christensen, Leonard R.; and Horibata, Hiroshi. Lighted tool holder. 4,348,715, Cl. 362-109.000.

Christiansen, David W.; and Smith, Bob G., to United States of America, Energy. Nuclear reactor fuel assembly duct-tube-to-inlet-nozzle attachment system. 4,348,353, Cl. 376-364.000.

Chrysler Corporation: *See*—
Hormel, Ronald F.; and Miesterfeld, Frederick O. R., 4,348,613, Cl. 315-130.000.

Chu, Pak-Jong, to Northern Telecom Limited. Rotary switch using a flexible circuit member. 4,348,559, Cl. 200-11.00R.

Chubb, Talbot A., to United States of America, Navy. Thermochemical energy transport process. 4,347,891, Cl. 165-1.000.

Chujo, Takao: *See*—
Mitsuishi, Yukio; Shiozaki, Shigeru; Chujo, Takao; and Yokoyama, Takeyuki, 4,348,446, Cl. 428-148.000.

Chung, Rack H., to General Electric Company. Abrasion resistant ultraviolet light curable hard coating compositions. 4,348,462, Cl. 428-412.000.

Ciba-Geigy AG: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, 4,348,334, Cl. 260-505.00C.
Neale, Denis M.; Bontoft, Frederick J.; and Ikin, John B., 4,348,114, Cl. 356-431.000.

Ciba-Geigy Corporation: *See*—
Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, 4,348,408, Cl. 424-305.000.
Boger, Manfred; and Drabek, Jozef, 4,348,405, Cl. 424-298.000.
Cespon, Manuel, 4,348,234, Cl. 106-21.000.
Clark, Malcolm C.; and Henshall, John B., 4,348,330, Cl. 260-456.0NS.
Di Benedetto, Marianne; and Gannon, John A., 4,348,505, Cl. 525-504.000.
Ehrenfreund, Josef, 4,348,412, Cl. 424-322.000.
Gsell, Laurenz; and Gehret, Jean-Claude, 4,348,414, Cl. 424-327.000.
Haug, Theobald, 4,348,511, Cl. 528-72.000.
Karrer, Friedrich; and Moser, Paul, 4,348,524, Cl. 546-187.000.
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,348,530, Cl. 549-27.000.
Ruhlmann, Edmond, 4,348,318, Cl. 260-153.000.
Skelly, James K.; Evans, David G.; and Broadbent, Barrie, 4,348,203, Cl. 8-501.000.
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,348,221, Cl. 71-94.000.
Wick, Arnold, 4,348,239, Cl. 106-193.000D.

Cincinnati Milacron Inc.: *See*—
Wood, David B., III, 4,348,044, Cl. 294-88.000.

Cladan Incorporated: *See*—
Wallace, Clarence L., 4,348,714, Cl. 361-328.000.

Claflin, Warren E.: *See*—
Lanzillotti, Harry V.; Burnett, George H.; Wayte, Alline R.; Osdene, Thomas S.; Claflin, Warren E.; Lilly, A. Clifton, Jr.; and Nienow, John F., 4,347,855, Cl. 131-78.000.

Clarion Co., Ltd.: *See*—
Minagawa, Shoichi; and Okamoto, Takeshi, 4,348,650, Cl. 333-195.000.
Shiun, Toshimi; Fujii, Hideo; and Kizaki, Yoshio, 4,348,762, Cl. 371-47.000.
Takagi, Satoshi; and Watanabe, Toshio, 4,348,704, Cl. 360-96.500.

Clark, Malcolm C.; and Henshall, John B., to Ciba-Geigy Corporation. Process for the production of sulphinates of benzhydrol compounds. 4,348,330, Cl. 260-456.0NS.

Clark, Richard J.: *See*—
Hawkins, Harold R.; Gardner, Clive A.; Roke, Lindsey J.; Clark, Richard J.; and Rumble, Warwick F., 4,348,068, Cl. 312-257.00R.

Clarke, David E.; Davies, James F.; and Tune, John B., to Lever Brothers Company. Water-insoluble, water-permeable bag having a

water-soluble or water-dispersable protective layer and containing a particulate detergent composition. 4,348,293, Cl. 252-90.000.

Claussen, Reimer; and Jung, Liebhard, to A. Ott GmbH. Mechanism for operating a collet chuck. 4,347,753, Cl. 74-110.000.

Clavel, Raymond, to Hermes Precisa International S.A. Strike and non-strike impact control mechanism for typewriter. 4,348,121, Cl. 400-166.000.

Clavier, Christian M. J.; Hepp, Vincent R.; and Dumestre, Alexis C., to Schlumberger Technology Corporation. Dipmeter displacement processing technique. 4,348,748, Cl. 367-25.000.

Clayton, William J., to Mobil Oil Corporation. Thermoplastic food wrapping film having improved cling. 4,348,455, Cl. 428-336.000.

Clearman, Jack F.; and Gurubatham, Vincent P., to Whirlpool Corporation. Dishwasher soil separator. 4,347,861, Cl. 134-104.000.

Clements Industries, Inc.: *See*—
Furutu, Akira, 4,347,932, Cl. 206-343.000.

Clendening, Steven J., to Rockwell International Corporation. Divide by three clock divider with symmertical output. 4,348,640, Cl. 328-41.000.

Clewett, Merle E.: *See*—
Curry, Robert D.; Larson, Richard C.; and Clewett, Merle E., 4,347,922, Cl. 193-23.000.

Clyne, Arthur J.; Knarr, John E.; and Miller, Stanley, to Energy Recycling Company of Michigan. Energy storage unit and system. 4,347,892, Cl. 165-10.000.

Co-Gen, Inc.: *See*—
Tawse, Ian S., 4,347,702, Cl. 60-618.000.

Coakley, John E.; and Nolan, James J., to Slurry Mining Engineering Inc. Method and apparatus for slurry borehole mining. 4,348,058, Cl. 299-17.000.

Cockerill and Centre de Technologies Nouvelles: *See*—
Lizen, Christian E., 4,347,790, Cl. 102-304.000.

Cohen, Richard J.: *See*—
Shelnut, James; and Cohen, Richard J., 4,348,471, Cl. 430-165.000.

Cohen, Sabatino, to Saint-Gobain Vitrage. Glazing possessing selective transmission and reflection spectra. 4,348,453, Cl. 428-333.000.

Coit, Kenneth T.: *See*—
Farrell, Robert J.; Coit, Kenneth T.; Vernon, John H.; Yu, Kin C.; Huettner, Robert E.; and Grandmaison, John P., 4,348,725, Cl. 364-300.000.

Colgate-Palmolive Company: *See*—
Gaffar, Abdul; and Davis, Calvin B., 4,348,381, Cl. 424-52.000.
Nardone, Robert M., 4,347,970, Cl. 229-39.00R.
Pierce, Robert C.; and Mitchell, Robert L., 4,348,382, Cl. 424-52.000.

Colin, Jean P., to Bretagne ACB Corporation. Barge and tug connection system. 4,347,801, Cl. 114-248.000.

Collier, Donald C. Microwave antenna with sinuous waveguide feed. 4,348,680, Cl. 343-778.000.

Columbus, Richard L., to Eastman Kodak Company. Self-cleaning nozzle construction for aspirators. 4,347,875, Cl. 141-18.000.

Combustion Engineering, Inc.: *See*—
Barger, John J.; and Underwood, James R., 4,348,574, Cl. 219-73.210.

Commissariat a l'Energie Atomique: *See*—
Artaud, Robert; Aubert, Michel; Elbeze, Richard; and Jogand, Patrick, 4,348,354, Cl. 376-405.000.
Feutrel, Claude, 4,347,966, Cl. 228-173.00F.

Commonwealth Scientific and Industrial Research Organization: *See*—
Holan, George; and O'Keefe, David F., 4,348,409, Cl. 424-308.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Binder, Jean-Jacques, 4,348,684, Cl. 346-153.100.

Cones, David J.: *See*—
Davis, Edgar D.; and Cones, David J., 4,348,544, Cl. 585-300.000.

Conforti, Maurizio. Coupling joint. 4,348,129, Cl. 403-218.000.

Congdon, George L., to Norland Corporation. Cardiac pacer having quick-connect lead terminals. 4,347,849, Cl. 128-419.00P.

Conley, Richard W.: *See*—
Schmitt, Edward L.; Caroleo, Steven J.; Bolam, Charles W.; and Conley, Richard W., 4,348,006, Cl. 251-288.000.

Conoco Inc.: *See*—
Ruckel, P. Jay, 4,348,237, Cl. 106-122.000.

Consolazio, George A.; Sheppard, James A.; and Laramee, Benjamin E., to General Foods Corporation. Sprayable plant care composition. 4,348,424, Cl. 427-4.000.

Consolidated Foods Corporation: *See*—
Goodman, James A., 4,347,934, Cl. 206-633.000.

Consumers Glass Company Limited: *See*—
Mancini, Derek V., 4,348,162, Cl. 417-431.000.

Continental Group, Inc., The: *See*—
Boik, Elmer J.; and Marshall, F. Paul, 4,347,940, Cl. 215-253.000.
Khoury, Nick S., 4,348,464, Cl. 428-571.000.
Millspaugh, Russell E., 4,347,928, Cl. 198-690.000.

Continental-Wirt Electronics Corp.: *See*—
Worth, Sidney V.; and Nelson, Keith D., 4,348,073, Cl. 339-186.00M.

Conversational Systems, Inc.: *See*—
Boldridge, Austin G., Jr., 4,348,638, Cl. 324-127.000.

Cooper, Frank W., Jr.; and Gastner, Raymond P., to Westinghouse Electric Corp. Method for servicing a steam generator. 4,347,652, Cl. 29-407.000.

Cooper, Jack M., to General Screw Products Company. Grease fitting. 4,347,915, Cl. 184-105.00B.

Cooper, Jerry W.: *See*—
Medford, Richard D.; Henry, Pearison W.; and Cooper, Jerry W., 4,347,685, Cl. 47-28.00R.

Cooper Laboratories, Inc.: *See*—
Cappel, Leona R., 4,348,207, Cl. 23-230.00B.

Copal Company Limited: *See*—
Fujiwara, Toshimasa; and Sudo, Yoshiyuki, 4,348,125, Cl. 400-645.100.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Irradiated blends of polyethylene and neoprene rubber. 4,348,266, Cl. 204-159.170.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of epichlorohydrin rubber and carboxy-ethylene polymer resin. 4,348,501, Cl. 525-179.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of nylon and ethylene-vinyl acetate rubber. 4,348,502, Cl. 525-183.000.

Cornelius, Dennis A., to Miles Laboratories, Inc. Process for decreasing the thermal stability of microbial rennet. 4,348,482, Cl. 435-223.000.

Cornell Research Foundation, Inc.: *See*—
Kinsella, John E.; and Shetty, Jayarama K., 4,348,479, Cl. 435-183.000.

Cornell, Richard R. Molding strip having a curvilinear surface and a method for making same from laminar sheet material. 4,348,448, Cl. 428-157.000.

Cornell, William F.; Vear, John P.; and Pascuzzi, E. Anthony, to Champion International Corporation. Stackable carton for perishable commodities. 4,347,968, Cl. 229-33.000.

Coulon, Christian. Process and apparatus for atomizing and burning liquid fuels. 4,348,168, Cl. 431-9.000.

Coulter Electronics, Inc.: *See*—
Leif, Robert C., 4,348,107, Cl. 356-72.000.

Cowlin, Robert M.; and Helsby, Nigel C., to Lockwood Graders (UK) Limited. Article sorting apparatus and method. 4,348,277, Cl. 209-705.000.

Craig, Alan D., to Hercules Incorporated. Nonwoven fabric from a combination of thermoplastic netting and oriented film. 4,348,444, Cl. 428-137.000.

Craig, Alan D., to Hercules Incorporated. Reinforced film of a combination of thermoplastic netting and oriented film. 4,348,445, Cl. 428-138.000.

Crain, Jack A. Blowout preventor test system. 4,347,733, Cl. 73-40.50R.

Cramm, Gunther: *See*—
Lobach, Wilfried; Kolb, Gunter; Lehmann, Wolfgang; Cramm, Gunther; Muller, Friedhelm; and Muszik, Janos, 4,348,514, Cl. 528-367.000.

Craubner, Ingo, to Wacker-Chemie GmbH. Thermal insulation, a process for preparing said insulation and a pipe insulated therewith. 4,348,243, Cl. 156-71.000.

Criss, Jeremy F. Organic material recycling method and device. 4,347,632, Cl. 4-449.000.

Cromer, John A., Jr. Chair lift. 4,347,913, Cl. 182-142.000.

Crompton, Charles E.; Kazi, Abdulla M. Z.; and Soni, Inderjit S., to PPG Industries, Inc. Process for making colloidal sols of antimony pentoxide in an aqueous medium. 4,348,301, Cl. 252-313.00R.

Crosfield Electronics Limited: *See*—
Chase, Bryan B.; and Yi, Alberto, 4,347,785, Cl. 101-1.000.

Crudele, Lester M.: *See*—
Gunter, Thomas G.; Crudele, Lester M.; and Zolnowsky, John E., 4,348,722, Cl. 364-200.000.

Cukier, Maurice; and Sellier, Daniel, to International Business Machines Corporation. Multiple-function programmable logic arrays. 4,348,737, Cl. 364-900.000.

Culver, Frederick H., to Fritz Culver, Inc. Retractable towing pin. 4,347,800, Cl. 114-218.000.

Culver, Robert B. Portable drilling rig. 4,347,692, Cl. 52-117.000.

Curry, Robert D.; Larson, Richard C.; and Clewett, Merle E., to Union Iron Works, Inc. Grain distributor assembly for grain elevator. 4,347,922, Cl. 193-23.000.

Cushing, David E.; and Stanley, Philip E., to Honeywell Information Systems Inc. Address pairing apparatus for a control store of a data processing system. 4,348,724, Cl. 364-200.000.

Cushing, David E.: *See*—
Woods, William E.; Cushing, David E.; and Stanley, Philip E., 4,348,723, Cl. 364-200.000.

Cyborex Laboratories, Inc.: *See*—
Emerson, Paul J.; and Hedges, Walter P., 4,348,730, Cl. 364-483.000.

D I E H L, Firma: *See*—
Werner, Arnold; Ennen, Peter; Nuebauer, Josef; Flaig, Hans; and Allgaier, Juergen, 4,348,753, Cl. 368-188.000.

Dahl, Norman C. Hollow externally threaded fasteners having greatly increased ductility. 4,348,141, Cl. 411-389.000.

Daikin Kogyo Co., Ltd.: *See*—
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,348,363, Cl. 422-192.000.

Daimler-Benz Aktiengesellschaft: *See*—
Besslein, Wulf, 4,347,814, Cl. 123-261.000.
Schmidt, Hans-Georg, 4,347,815, Cl. 123-269.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Horikoshi, Isamu; Sakuragawa, Nobuo; Ueno, Masaharu; and Takahashi, Kaoru, 4,348,384, Cl. 424-101.000.

Dalton, Richard L., Jr., to Tecumseh Products Company. Method of making stick wound coils. 4,347,659, Cl. 29-605.000.

Danfoss A/S: *See*—
Hyldal, Jorgen, 4,348,621, Cl. 318-254.000.

Jakobsen, Jakob S., 4,347,976, Cl. 236-68.00B.
Tankred, Hans J.; Madsen, Per J.; and Stannow, Jorgen C., 4,348,607, Cl. 310-217.000.
Daniels, Herbert E.; Stehman, Harold E.; and Moran, Brian P., to General Electric Company. X-ray tube anode voltage compensator. 4,348,590, Cl. 378-112.000.
Daniels, Lowell W.: *See*—
Luebke, Clement J.; and Daniels, Lowell W., 4,347,833, Cl. 126-369.000.
Daniels, Peter J. L.: *See*—
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,348,516, Cl. 536-10.000.
David, Roger J. P.; and Lande, Maurice A., to Association des Ouvriers en Instruments de Precision. Manual control means for controlling the movements of a motor-driven element. 4,348,634, Cl. 323-353.000.
Davies, James F.: *See*—
Clarke, David E.; Davies, James F.; and Tune, John B., 4,348,293, Cl. 252-90.000.
Davies, Robert: *See*—
Newton, Barrie H.; Booth, Peter L.; and Davies, Robert, 4,348,646, Cl. 331-77.000.
Davis, Calvin B.: *See*—
Gaffar, Abdul; and Davis, Calvin B., 4,348,381, Cl. 424-52.000.
Davis, Edgar D.; and Cones, David J., to Phillips Petroleum Company. Recovery of propane from HF alkylation vent gas. 4,348,544, Cl. 585-300.000.
Davis, Rex M.: *See*—
Ray, William F.; and Davis, Rex M., 4,348,619, Cl. 318-139.000.
Davis, William F., to Motorola, Inc. Bandgap voltage regulator having low output impedance and wide bandwidth. 4,348,633, Cl. 323-314.000.
Dawson, Peter E., to Ipco Corporation. Retaining device for a removable dental prosthesis. 4,348,181, Cl. 433-172.000.
Dayco Corporation: *See*—
Medford, Richard D.; Henry, Pearison W.; and Cooper, Jerry W., 4,347,685, Cl. 47-28.00R.
Oliver, Larry R., 4,348,197, Cl. 474-28.000.
Deamer, Charles R., to Noyes Bros. Pty. Limited. Mobile transporter for mines. 4,348,149, Cl. 414-458.000.
Deaver, Randall L.; Freund, Thomas J.; and Gerstle, Patrick J., to International Business Machines Corporation. Terminal providing communication system information output. 4,348,739, Cl. 364-900.000.
de Boer, Jacob, to U.S. Philips Corporation. Magnetic tape drive arrangement. 4,347,994, Cl. 242-203.000.
DeBoer, Jonathan J.: *See*—
Alter, William F.; DeBoer, Jonathan J.; and Shellenberger, Charles R., 4,347,926, Cl. 198-388.000.
Decoster, Michel H. F., to U.S. Philips Corporation. Record player control mechanism. 4,348,756, Cl. 369-226.000.
Deepsea Ventures, Inc.: *See*—
Latimer, John P., 4,347,675, Cl. 37-57.000.
Deguara, Albert. Safety apparatus for vehicles. 4,347,910, Cl. 180-268.000.
Dehen, Frederick L. Apparatus for converting rotary motion to a rectilinear force. 4,347,752, Cl. 74-84.00R.
Dehne, Manfred F. Particulate separation device. 4,348,215, Cl. 55-349.000.
Dekkers, Leo P., to Dennison Manufacturing Company. Ladder strap harnessing device with webbed tail. 4,347,648, Cl. 24-16.0PB.
Delalande S.A.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,348,393, Cl. 424-248.570.
Deleris, Robert, to Regie Nationale des Usines Renault. Process and apparatus for electronic angle of advance correction in response to pinging and engine charge. 4,347,820, Cl. 123-417.000.
Demny, Werner, to Friedrich Kocks GmbH & Co. Rolling blocks. 4,347,725, Cl. 72-234.000.
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, to VEB Werk fur Fernsehelektronik im Veb Kombinat Mikroelektronik. Liquid crystalline substituted 1,3-dioxanes and mixtures containing these. 4,348,324, Cl. 549-369.000.
Demus, Dietrich: *See*—
Zaschke, Horst; Wolff, Rudolf; Pelzl, Gerhard; and Demus, Dietrich, 4,348,298, Cl. 252-299.100.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Furuya, Takeshi; Uchiyama, Yoshihisa; and Kouda, Akinori, 4,348,341, Cl. 264-8.000.
Dennison Manufacturing Company: *See*—
Dekkers, Leo P., 4,347,648, Cl. 24-16.0PB.
Denzin, Horst, to Francotyp GmbH. Well sides in letter feeding and letter sealing machines. 4,348,249, Cl. 156-442.200.
Derks, Petrus J. A. M.: *See*—
Dieleman, Jan; Van Dommelen, Joannes H. J.; and Derks, Petrus J. A. M., 4,348,610, Cl. 313-386.000.
Desai, Kamalesh S.; and Melvin, George E., to International Business Machines Corporation. Process for monitoring solvent content of green ceramic sheet, and apparatus therefor. 4,347,735, Cl. 73-73.000.
DeShon, Wallace E., to Phillips Petroleum Company. Computer acquisition of data from nonaddressable switches. 4,348,670, Cl. 340-825.780.
DeVere, James W.: *See*—
Wilding, Edwin; and DeVere, James W., 4,348,148, Cl. 414-421.000.
De Zaepffel, Brigitte C. R. Ileostomic bag. 4,347,843, Cl. 128-283.000.
d'Hautecourt, Alain H., to Zenith Radio Corporation. Noise processor defeat switch. 4,348,695, Cl. 358-160.000.
Dias, Francisco J.; Hannen, Willi; Luhleich, Hartmut; and Pflaum, Peter, to Kernforschungsanlage Juich, Gesellschaft mit beschrankter Haftung. Vacuum-drying method and apparatus. 4,347,671, Cl. 34-15.000.
Diaz, Zaida: *See*—
Blytas, George C.; and Diaz, Zaida, 4,348,368, Cl. 423-226.000.
Di Benedetto, Marianne; and Gannon, John A., to Ciba-Geigy Corporation. Adducts from amines and di- and polyepoxides. 4,348,505, Cl. 525-504.000.
Dichtjar, Gerhard: *See*—
Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, 4,348,339, Cl. 264-0.500.
Dickmanns, Heinz: *See*—
Bauer, Wolfgang; Dickmanns, Heinz; Morgenroth, Konstantin; Reh, Kuno; and Ribka, Joachim, 4,348,204, Cl. 8-527.000.
Dickore, Karlfried; and Kuhle, Engelbert, to Bayer Aktiengesellschaft. Process for the preparation of N-substituted imido-dicarboxylic acid diaryl esters. 4,348,331, Cl. 260-465.00D.
Didier Engineering GmbH: *See*—
Friedrichs, Gregor, 4,347,672, Cl. 34-57.00R.
Dieleman, Jan; Van Dommelen, Joannes H. J.; and Derks, Petrus J. A. M., to U.S. Philips Corporation. Camera tube with graded tellurium or arsenic target. 4,348,610, Cl. 313-386.000.
DiFulvio, Anthony P.: *See*—
Tersteeg, Glenn E.; and DiFulvio, Anthony P., 4,347,750, Cl. 73-864.310.
Dills, Raymond L., to General Electric Company. Flux shaping arrangement for induction surface unit. 4,348,571, Cl. 219-10.49R.
Disselnkotter, Hans: *See*—
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,348,332, Cl. 260-502.40R.
Djedjeva, Galina M.: *See*—
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,348,481, Cl. 435-234.000.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Struck, Carl-Heinz; and Schumacher, Ralf, 4,348,258, Cl. 202-255.000.
Dolejs, Anthony H.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,348,656, Cl. 340-146.30R.
Dombrowski, Theodor; and Luzina, Max, to Wilhelm Hegenscheidt Gesellschaft mbH. Underfloor lathe for profiling wheel sets. 4,347,769, Cl. 82-8.000.
Domer, Michel, to Hutchinson-Mapa. Shock absorbers. 4,348,015, Cl. 267-140.400.
Donovan, David M., to Waldemar S. Nelson & Co. Spill oil containment system. 4,348,136, Cl. 405-65.000.
Dormia, Enrico, to Porges. Surgical extractor. 4,347,846, Cl. 128-328.000.
Dorr, Wolfgang: *See*—
Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, 4,348,339, Cl. 264-0.500.
Dostert, Phillippe L.: *See*—
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Dotsko, Martin, to Singer Company, The. Aerial image visual display. 4,348,187, Cl. 434-44.000.
Dougherty, John J., to Reliance Electric Company. Converter by stored switching pattern. 4,348,734, Cl. 364-721.000.
Doundoulakis, George J. Integrated circuit tester. 4,348,636, Cl. 324-73.00R.
Douzon, Colette A.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,348,393, Cl. 424-248.570.
Dow Chemical Company, The: *See*—
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Bauman, William C.; and Lee, John M., 4,348,297, Cl. 252-184.000.
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Dozier, Harold W., to Mostek Corporation. Single chip MOS/LSI microcomputer with binary timer. 4,348,743, Cl. 364-900.000.
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Dufour, Charles H.; Gelinas, W. Robert; Stankosky, Michael J.; and Washchynsky, Bohdan D., to Harris Corporation. Plate lockup mechanism. 4,347,788, Cl. 101-415.100.
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English Electric Company Limited, The: *See*—
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English, George J.; and Scholz, John A., to GTE Products Corporation. Subminiature photoflash lamp with spaced-apart, light-emitting pyrotechnic charges. 4,348,173, Cl. 431-362.000.
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Escamilla-Kelly, Ricardo. Multi-level game board apparatus. 4,348,027, Cl. 273-241.000.

Essex Group, Inc.: *See—*
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,348,460, Cl. 428-383.000.
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Kammer, Paul A.; Yurasko, George, Jr.; and Zmrzlik, Karel, 4,348,434, Cl. 427-423.000.
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Hou, Ching T., 4,348,476, Cl. 435-123.000.
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Worley, Arthur C., 4,347,865, Cl. 137-375.000.
Eyden, Everett A. Hanger for concrete deck forming apparatus. 4,348,002, Cl. 249-19.000.
Eyden, Everett A. Ledger for concrete deck forming apparatus. 4,348,004, Cl. 249-210.000.
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Fariss, James D., Jr., to Innovation Enterprises, Inc. Easily removable handle means for axes and the like. 4,347,883, Cl. 145-61.00R.
Farrar, Gordon A., to Owens-Corning Fiberglas Corporation. Wedge shaped electrode block. 4,348,767, Cl. 373-30.000.
Farrell, Robert J.; Coit, Kenneth T.; Vernon, John H.; Yu, Kin C.; Huettner, Robert E.; and Grandmaison, John P., to Honeywell Information Systems Inc. Communication line service interrupt technique for a communications processing system. 4,348,725, Cl. 364-300.000.
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Felcht, Utz-Hellmuth, to Hoechst Aktiengesellschaft. Process for the manufacture of 1-halogen-1-oxo-Δ^3-phospholenes. 4,348,337, Cl. 260-543.00P.
Felder, Ernst; and Pitre, Davide, to Bracco Industria Chimica S.p.A. New derivatives of 2,4,6-triiodo-isophthalic acid, proceses for their synthesis and X-ray contrasting materials containing these. 4,348,377, Cl. 424-5.000.
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Figge, Irving E. Structural panel. 4,348,442, Cl. 428-72.000.
Figour, Jean, to Regie Nationale des Usines Renault. Six-axes manipulator. 4,348,142, Cl. 414-2.000.
Fima, Raoul G. Intermittently illuminated fishing lure with travelling electrical contact. 4,347,681, Cl. 43-17.600.
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Fischer, Jochen: *See—*
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Fisher, Harry W.; and Perrine, Eugene B., to Rockwell International Corporation. Control apparatus for meter prover. 4,347,731, Cl. 73-3.000.
Fisher, Matthew J.; and Gregory, William J., Jr., to United States of America, Army. Method and apparatus for calibrating gyroscopically-stabilized, magnetically-slaved heading reference system. 4,347,730, Cl. 73-1.00E.
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Florin, Robert E. Position sensitive mercury switch. 4,348,562, Cl. 200-52.00R.
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Furuya, Takeshi; Uchiyama, Yoshihisa; and Kouda, Akinori, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for production of precursor of alumina fiber. 4,348,341, Cl. 264-8.000.
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General Tire & Rubber Company, The: *See—*
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George, Richard W.; and Schnell, William J., to Baxter Travenol Laboratories, Inc. Proportioning dialysis machine. 4,348,280, Cl. 210-101.000.
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Gerlach, Jurgen. Heat exchanger. 4,347,894, Cl. 165-76.000.
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Ginn, Martin E., to Walton-March, Inc. Multi-layered liquid detergent-builder concentrate compositions which on addition to water produce stable cleaning solutions. 4,348,292, Cl. 252-90.000.
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Glesser, Louis S. Pocket knife. 4,347,665, Cl. 30-161.000.
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Gontowski, Walter S., Jr., to Sprague Electric Company. Method for making custom integrated circuits and metallization artwork therefor. 4,348,451, Cl. 428-203.000.
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Gorsh, Joseph W., to United States of America, Agriculture. Running skyline intermediate support and multi-span carriage. 4,347,938, Cl. 212-121.000.
Gosline, Scott P.; Stembridge, William F.; and Sturrock, James C. Bipolar temperature measuring apparatus. 4,347,854, Cl. 128-736.000.
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Gottlieb, Milton; and Brandt, Gerald B., to Westinghouse Electric Corp. Bulk acoustic wave integrated optical deflector and monolithic A/D converter using such deflector. 4,348,075, Cl. 350-96.130.
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Grossman, Gershon; Sivan, Gideon; Chefner, Tudor; and Matania, Eliyahu. Method of connecting thin metal sheets to metal tubes. 4,347,965, Cl. 228-107.000.
Grosso, Vincent A., to Raytheon Company. Spin-stabilized projectile and guidance system therefor. 4,347,996, Cl. 244-3.160.
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Haisma, Jan: *See*—
Joormann, Hendrik J. M.; Verweij, Hendrik; and Haisma, Jan, 4,348,484, Cl. 501-45.000.
Haldor Topsoe A/S: *See*—
Schoubye, Peter C. S., 4,348,373, Cl. 423-522.000.
Half Court Tennis Pty. Limited: *See*—
Wills, Neville D.; and Kwiatkowski, Sigmund, 4,348,025, Cl. 273-73.00R.
Haljun, William R.: *See*—
Youngclaus, William P., Jr., 4,347,839, Cl. 128-62.00A.
Halliburton Company: *See*—
Barrington, Burchus Q., 4,347,900, Cl. 166-380.000.
Hamada, Minoru; Nakamura, Nobuyuki; and Odajima, Akira, to Nippon Paint Co., Ltd. Container for filling in liquid. 4,347,948, Cl. 220-404.000.
Hammann, Ingeborg: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,348,394, Cl. 424-248.570.
Hammes, Theo, to Mauser-Kommandit Gesellschaft. Container and cover with two gasket seal. 4,347,947, Cl. 220-378.000.
Hammond, Charles E.: *See*—
Borror, Alan L.; Ellis, Ernest W.; and Hammond, Charles E., 4,348,529, Cl. 549-22.000.
Hammond, Craig B., to Verbatim Corporation. Method for burnishing. 4,347,689, Cl. 51-281.0SF.
Hamprecht, Gerhard: *See*—
Husslein, Gerd; and Hamprecht, Gerhard, 4,348,534, Cl. 560-62.000.
Hamprecht, Rainer, to Bayer Aktiengesellschaft. Process for the preparation of cyano-azo dyestuffs. 4,348,319, Cl. 260-208.000.
Hanai, Toshinori: *See*—
Oonuma, Koichiro; Kawashima, Yoshinori; and Hanai, Toshinori, 4,348,199, Cl. 474-156.000.
Hanger, William A.: *See*—
Carson, Andrew B., Jr.; and Hanger, William A., 4,348,119, Cl. 400-121.000.
Hannen, Willi: *See*—
Dias, Francisco J.; Hannen, Willi; Luhleich, Hartmut; and Pflaum, Peter, 4,347,671, Cl. 34-15.000.
Hanner, Paul J. Dial indicator holder. 4,348,000, Cl. 248-231.000.
Hanson, Larry K.; and Bosdachin, Silvano A., to Fluorocarbon Company, The. Head gasket having resilient seal with Belleville springs. 4,348,032, Cl. 277-235.00B.
Hara, Toshito: *See*—
Baba, Masanori; and Hara, Toshito, 4,348,566, Cl. 200-144.00B.
Harhold, Albrecht: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.
Harjar, Martin J., to Nordson Corporation. Flanged pipe fitting. 4,348,040, Cl. 285-175.000.
Harrington, Timothy A., to Rockwell International Corporation. Feedforward wideband amplifier. 4,348,642, Cl. 330-149.000.
Harris Corporation: *See*—
Dufour, Charles H.; Gelinas, W. Robert; Stankosky, Michael J.; and Washchynsky, Bohdan D., 4,347,788, Cl. 101-415.100.
Harris & Thrush Manufacturing Company: *See*—
Johnson, Don R., 4,347,696, Cl. 56-16.600.
Harrison, Herman W., to Texas Instruments Incorporated. Calculator with algebraic operating system. 4,348,733, Cl. 364-709.000.
Harshman, George A. Wall construction for a belly dump trailer. 4,348,047, Cl. 296-184.000.
Hartwich, Gerhard: *See*—
Pav, Josef; Hartwich, Gerhard; and Prey, Jorg, 4,347,784, Cl. 100-162.00R.
Harvey, James F.; Chambers, Walter S.; and Kulik, John J., to United States of America, Navy. Pilot helmet mounted CIG display with eye coupled area of interest. 4,348,186, Cl. 434-44.000.
Harz, Peter: *See*—
Krude, Werner; and Harz, Peter, 4,348,196, Cl. 464-11.000.
Hassan, Javathu K.; and Paivanas, John A., to International Business Machines Corp. Gas film wafer transportation system. 4,348,139, Cl. 406-10.000.
Hassell, Aarno A. Air deflector for motor vehicle windows. 4,347,781, Cl. 98-2.120.
Hassenzahl, William V.: *See*—
Boenig, Heinrich J.; and Hassenzahl, William V., 4,348,630, Cl. 323-207.000.
Haug, Theobald, to Ciba-Geigy Corporation. Process for the preparation of crosslinked, unsaturated polymers and the polymers thus obtained. 4,348,511, Cl. 528-72.000.
Haussonne, Francois J.; Moisan, Guy; and Prigent, Hubert. Electric contact device with liquid conductors. 4,348,570, Cl. 200-191.000.

Haverland, William H.; and Hiler, Albert R., to Hospal Medical Corporation. Cutting elements for knitting machines. 4,347,718, Cl. 66-84.00A.

Hawkes, Ivor: *See*—
Wright, David; and Hawkes, Ivor, 4,348,635, Cl. 324-52.000.

Hawkins, Harold R.; Gardner, Clive A.; Roke, Lindsey J.; Clark, Richard J.; and Rumble, Warwick F., to Fisher & Paykel Limited. Refrigerator casing. 4,348,068, Cl. 312-257.00R.

Haworth Mfg., Inc.: *See*—
Borgman, Randall W., 4,347,721, Cl. 70-380.000.

Hayakawa, Yoshihiro: *See*—
Matsuda, Akira; Hayakawa, Yoshihiro; Yasuda, Shigeo; and Iwasaki, Motoaki, 4,348,654, Cl. 340-58.000.

Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, to Seitetsu Kagaku Co., Ltd. Tanning process and tanning compositions. 4,348,201, Cl. 8-94.180.

Hayashi, Yukichi; Sugimoto, Osamu; and Yokohda, Yutaka, to Kabushiki Kaisha Nippon Coinco. General coin counting device for automatic vending machine. 4,347,860, Cl. 133-1.00R.

Hayashi, Yukichi; Tamara, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, to Nippon Coinco Co. Ltd. Control system for a vending machine. 4,347,924, Cl. 194-1.00N.

Hayes, Frank, III; and McGinty, Joseph R., to United States of America, Army. Pulse width spectrum analyzer. 4,348,637, Cl. 324-77.00B.

Hayes, Jerry R., to L. R. Nelson Corporation. Turret type sprinkler with improved turret assembly. 4,347,981, Cl. 239-394.000.

Haynes, David L.; and Brennan, John M., to Ampex Corporation. Digital delay for high quality audio use. 4,348,754, Cl. 369-60.000.

Hays, George O., Jr. Connector for extruded sections such as picture frame members. 4,348,127, Cl. 403-9.000.

Head, Brian E., to International Standard Electric Corporation. Method of making magnetic reed contact unit. 4,347,658, Cl. 29-602.00R.

Hedges, Walter P.: *See*—
Emerson, Paul J.; and Hedges, Walter P., 4,348,730, Cl. 364-483.000.

Hedgespeth, Clofford L. Large round hay bale mover. 4,348,143, Cl. 414-24.500.

Hedren, A. Thomas; and Larsson, Rolf G., to ESAB Aktiebolag. Contact device. 4,348,575, Cl. 219-86.330.

Hein, Richard D., to General Tire & Rubber Company, The. Resilient strip and metal carrier therefor. 4,348,443, Cl. 428-122.000.

Heinlein, Hans. Sharpener for steel edges of skis. 4,347,766, Cl. 76-83.000.

Heintze, Hans U. Press roller contamination measurement. 4,347,749, Cl. 73-863.210.

Heinz, Werner. Rotary viscometer. 4,347,734, Cl. 73-59.000.

Heise, Arend: *See*—
Franckowiak, Gerhard; Meyer, Horst; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,348,395, Cl. 424-250.000.

Held, Hans-Dieter; and Schaller, Waldemar, to Matth. Hohner AG. Plug for mouthpiece of a wooden recorder. 4,347,775, Cl. 84-380.00C.

Hellemans, Julianus J.: *See*—
Stievenart, Emile F.; Plessers, Hendrik S.; and Hellemans, Julianus J., 4,348,019, Cl. 271-10.000.

Helm, J. Thomas, to Dozier Equipment International Company. High-level dumping apparatus. 4,348,147, Cl. 414-420.000.

Helsby, Nigel C.: *See*—
Cowlin, Robert M.; and Helsby, Nigel C., 4,348,277, Cl. 209-705.000.

Helwerth, Rainer: *See*—
Frohlich, Horst; and Helwerth, Rainer, 4,348,302, Cl. 252-389.00R.

Hemminger, Herbert: *See*—
Schlayer, Wolfgang; and Hemminger, Herbert, 4,348,017, Cl. 269-296.000.

Henaff, Louis G.: *See*—
Jaouannet, Alain; Henaff, Louis G.; and Ramy, Jean-Pierre R., 4,348,685, Cl. 346-155.000.

Henderson, Wilmer P.: *See*—
King, Paul V.; Becher, Albert P.; and Henderson, Wilmer P., 4,347,796, Cl. 109-49.500.

Henkel Corporation: *See*—
Rogier, Edgar R., 4,348,543, Cl. 568-823.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Hennemann, Manfred; and Lohr, Albrecht, 4,348,305, Cl. 252-542.000.

Hennemann, Manfred; and Lohr, Albrecht, to Henkel Kommanditgesellschaft auf Aktien. Liquid detergent compositions comprising mixtures of alkyl polyglycol ethers and quaternary ammonium fabric softening agents. 4,348,305, Cl. 252-542.000.

Henry, Pearison W.: *See*—
Medford, Richard D.; Henry, Pearison W.; and Cooper, Jerry W., 4,347,685, Cl. 47-28.00R.

Henshall, John B.: *See*—
Clark, Malcolm C.; and Henshall, John B., 4,348,330, Cl. 260-456.0NS.

Henson, Thomas L.: *See*—
Ritsko, Joseph E.; MacInnis, Martin B.; and Henson, Thomas L., 4,348,231, Cl. 75-203.000.

Hentschel, Peter: *See*—
Stegmann, Horst; Meyl, Wolfgang; and Hentschel, Peter, 4,347,739, Cl. 73-170.00R.

Henville, Michael I., to Unimax Switch Limited. Snap action switches. 4,348,563, Cl. 200-67.00D.

Hepp, Vincent R.: *See*—
Clavier, Christian M. J.; Hepp, Vincent R.; and Dumestre, Alexis C., 4,348,748, Cl. 367-25.000.

Hercules Incorporated: *See*—
Craig, Alan D., 4,348,444, Cl. 428-137.000.
Craig, Alan D., 4,348,445, Cl. 428-138.000.
Maslanka, William W.; and Spence, Gavin G., 4,348,257, Cl. 162-162.000.

Hermann, Karl H.: *See*—
Buysch, Hans-Josef; Brassat, Bert; Eimers, Erich; and Hermann, Karl H., 4,348,495, Cl. 524-117.000.

Hermes Precisa International S.A.: *See*—
Clavel, Raymond, 4,348,121, Cl. 400-166.000.

Hermle, Eduard. Switching mechanism. 4,348,568, Cl. 200-153.0LB.

Herrin, Lenny, to Regent Paper Box Company. Hanging package. 4,347,930, Cl. 206-45.340.

Herrin, Melvin Bernard: *See*—
Seufert, Gerhard, 4,348,449, Cl. 428-167.000.

Herrold, Lear C.: *See*—
Gamble, James R.; Herrold, Lear C.; and Baran, Rowland S., 4,348,176, Cl. 432-258.000.

Hertz, David; Kurshan, Robert P.; and Malah, David, to Bell Telephone Laboratories, Incorporated. Cyclotomic tone detector and locator. 4,348,735, Cl. 364-724.000.

Herweh, John E.; Garrett, Thomas B.; and Magnusson, Alan B., to Armstrong World Industries, Inc. 3-Substituted-7-alkoxy-2,2'-Spirobi[2H-1-benzopyrans]. 4,348,508, Cl. 526-268.000.

Hetzel, Friedrich: *See*—
Goertler, Horst; Hetzel, Friedrich; Prohaska, Hans; Rachner, Horst; Seitter, Wolf; and Swoboda, Josef, 4,348,655, Cl. 340-73.000.

Hetzler, Ullrich: *See*—
Ruppel, Wolfgang; Hetzler, Ullrich; Vogt, Horst; and Wurfel, Peter, 4,348,611, Cl. 313-388.000.

Heuser, Jurgen: *See*—
Serini, Volker; Neumann, Rainer; Friedhofen, Gerhard; Freitag, Dieter; Heuser, Jurgen; and Schwarz, Hans-Helmut, 4,348,542, Cl. 568-727.000.

Hewlett-Packard Company: *See*—
Ackley, Donald E.; Engelmann, Reinhart W. H.; and Kerps, Dietrich, 4,348,763, Cl. 372-45.000.

Heyneman, Guido, to Siemens Aktiengesellschaft. Metering syringe. 4,348,160, Cl. 417-403.000.

Hibino, Sadayoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Polyphase armature windings. 4,348,606, Cl. 310-184.000.

Hicks, Graham P.; and Carter, Michael C., to ERA Patents Limited. Static inverter with energy return. 4,348,719, Cl. 363-132.000.

Higuchi, Kohei: *See*—
Okabayashi, Hidekazu; Higuchi, Kohei; and Nozaki, Tadatoshi, 4,348,746, Cl. 365-182.000.

Higuchi, Megumu: *See*—
Takahashi, Koichi; Higuchi, Megumu; and Watanabe, Minoru, 4,347,780, Cl. 91-375.00A.

Hiler, Albert R.: *See*—
Haverland, William H.; and Hiler, Albert R., 4,347,718, Cl. 66-84.00A.

Hillerstrom, Bjorn; Fransson, Lennarth; and Thuvander, Arne, to AB CTC. Apparatus for production of hot water. 4,347,972, Cl. 236-18.000.

Hilti Aktiengesellschaft: *See*—
Boehm, Edgar, 4,347,768, Cl. 82-1.500.

Hinchey, Richard J.; and Weber, Willis W., to Union Carbide Corporation. Zeolite LZ-200. 4,348,369, Cl. 423-328.000.

Hines, James E., Jr.; and LaBar, Richard G., deceased (by LaBar, Judith LePage, executor), to Aluminum Company of America. Composition for castable refractory block. 4,348,236, Cl. 106-38.270.

Hinson, Robin A. Racket sports training aid. 4,348,023, Cl. 273-29.00A.

Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, to Nippon Piston Ring Co., Ltd. Abrasion resistant ferro-based sintered alloy. 4,348,232, Cl. 75-238.000.

Hirohata, Michio; and Tezuka, Nobuo, to Canon Kabushiki Kaisha. Electromagnetically driven shutter. 4,348,092, Cl. 354-230.000.

Hirohata, Michio; and Sugitani, Hirosi, to Canon Kabushiki Kaisha. Rotor of electromagnetically driven device for exposure control. 4,348,094, Cl. 354-234.000.

Hisaka Works, Ltd.: *See*—
Sumitomo, Hiroyuki; and Uehara, Haruo, 4,347,897, Cl. 165-167.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Achiha, Masahiko, 4,348,689, Cl. 358-31.000.

Hitachi, Ltd.: *See*—
Achiha, Masahiko, 4,348,689, Cl. 358-31.000.
Igarashi, Osamu; Kugo, Masaru; and Watanabe, Shizuhisa, 4,348,726, Cl. 364-424.000.
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yochiteru; Kanno, Masayoshi; Kuniya, Jiro; and Itow, Hisao, 4,348,041, Cl. 285-286.000.
Ito, Tetsuo, 4,348,110, Cl. 356-328.000.
Kogawa, Takashi, 4,348,731, Cl. 364-513.000.
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,348,751, Cl. 368-82.000.
Nakamura, Kiyoshi; and Isaka, Masayoshi, 4,348,618, Cl. 318-38.000.
Sasayama, Takao; and Suda, Seiji, 4,348,729, Cl. 364-431.120.
Shimanuki, Shizuka; Matsumoto, Toshimi; Sato, Hiroshi; Onuma, Tsutomu; and Kirihara, Seishin, 4,348,131, Cl. 403-272.000.

Takasugi, Nobuhiro; and Kyomasu, Ryuichi, 4,347,964, Cl. 228-4.500.
Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,348,461, Cl. 428-409.000.
Yoshinaga, Shoji; Kawano, Hirosige; Todo, Matsuzo; Takahasi, Tosihiko; Fujiwara, Kiyoshi; and Inoue, Yukio, 4,348,288, Cl. 210-708.000.
Yoshioka, Masahiro; and Koike, Toshifumi, 4,348,065, Cl. 308-9.000.

Hockey, Edward J.: *See—*
Agrawal, Giridhari L.; and Hockey, Edward J., 4,348,066, Cl. 308-9.000.

Hoechst Aktiengesellschaft: *See—*
Felcht, Utz-Hellmuth, 4,348,337, Cl. 260-543.00P.
Frohlich, Horst; and Helwerth, Rainer, 4,348,302, Cl. 252-389.00R.
Gageur, Fritz, 4,347,960, Cl. 226-97.000.

Hoecke, David A., to Enercon Systems, Incorporated. Telescopable winter/summer air recirculator. 4,347,782, Cl. 98-33.00A.

Hoffman, John P., to Caterpillar Tractor Co. Frequency/speed controller. 4,348,585, Cl. 235-92.0CT.

Hoffmann-La Roche Inc.: *See—*
Kierstead, Richard W.; and Tilley, Jefferson W., 4,348,396, Cl. 424-251.000.
Montavon, Marc; and Reiner, Roland, 4,348,518, Cl. 544-026.000.
Pfister, Rudolf, 4,348,519, Cl. 544-33.000.

Hoiss, Jakob. Apparatus for aseptically discharging flowable substances. 4,347,877, Cl. 141-91.000.

Hokari, Hiroshi; and Nishitai, Iwaki, to Nippon Zeon Co., Ltd. Method for inhibiting polymerization of conjugated dienes. 4,348,260, Cl. 203-9.000.

Holan, George; and O'Keefe, David F., to Commonwealth Scientific and Industrial Research Organization. Insecticidal esters. 4,348,409, Cl. 424-308.000.

Holdeman, John W., to Borg-Warner Corporation. Planetary gear assembly. 4,347,762, Cl. 74-788.000.

Holley, John C.: *See—*
Golden, Martin P.; and Holley, John C., 4,348,356, Cl. 376-461.000.

Homeyer, Bernhard: *See—*
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.

Hon, John F.: *See—*
Cavalleri, Robert J.; Moon, Lamar F.; and Hon, John F., 4,348,764, Cl. 372-58.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Oonuma, Koichiro; Kawashima, Yoshinori; and Hanai, Toshinori, 4,348,199, Cl. 474-156.000.
Senzaki, Takaya; and Murao, Eiji, 4,348,675, Cl. 343-7.0VM.
Takemura, Hiroo; and Noda, Azusa, 4,347,909, Cl. 180-219.000.

Honda, Munenobu, to Elephant Chain Block Co., Ltd. Hoist with improved overload protection. 4,348,011, Cl. 254-350.000.

Honeywell Inc.: *See—*
Benton, Ronald; Kidder, Kenneth B.; Linderberg, Robert L.; Tinsley, Timothy M.; and Westley, Curtis E., 4,347,712, Cl. 62-175.000.
Mahnken, Walter J., 4,347,995, Cl. 242-204.000.
Pinckaers, B. Hubert; and Ruminsky, Robert T., 4,347,974, Cl. 236-46.00R.
Wu, M. T.; and Chai, Thomas Y., 4,347,709, Cl. 62-140.000.

Honeywell Information Systems Inc.: *See—*
Cushing, David E.; and Stanley, Philip E., 4,348,724, Cl. 364-200.000.
Farrell, Robert J.; Coit, Kenneth T.; Vernon, John H.; Yu, Kin C.; Huettner, Robert E.; and Grandmaison, John P., 4,348,725, Cl. 364-300.000.
Woods, William E.; Cushing, David E.; and Stanley, Philip E., 4,348,723, Cl. 364-200.000.

Hoover Universal, Inc.: *See—*
Straus, Albert E., 4,347,866, Cl. 137-436.000.

Hope, Thomasz S.; and Fombellida, Miguel, to Northern Telecom Limited. Control of a support filament for optical waveguides. 4,347,697, Cl. 57-9.000.

Hori, Hisashi: *See—*
Hori, Masaki; and Hori, Hisashi, 4,348,045, Cl. 296-14.000.

Hori, Kazumi: *See—*
Tsutsumi, Hisao; Hori, Kazumi; and Kawano, Junichi, 4,348,415, Cl. 424-365.000.

Hori, Masaki; and Hori, Hisashi, to Jidosha Seiko Co., Ltd. Device for opening and closing a side plate of a loading box on a motor truck under no-load condition. 4,348,045, Cl. 296-14.000.

Horibata, Hiroshi: *See—*
Christensen, Leonard R.; and Horibata, Hiroshi, 4,348,715, Cl. 362-109.000.

Horigome, Shinkichi: *See—*
Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,348,461, Cl. 428-409.000.

Horike, Akihiro: *See—*
Imanaka, Yoshihiko; Saito, Yoichi; and Horike, Akihiro, 4,348,456, Cl. 428-336.000.

Horikoshi, Isamu; Sakuragawa, Nobuo; Ueno, Masaharu; and Takahashi, Kaoru, to Dainippon Pharmaceutical Co., Ltd. Pharmaceutical composition for oral administration containing coagulation factor VIII or IX. 4,348,384, Cl. 424-101.000.

Hormel, Ronald F.; and Miesterfeld, Frederick O. R., to Chrysler Corporation. Lamp failure indicating circuit. 4,348,613, Cl. 315-130.000.

Hosoda, Yutaka: *See—*
Oohasi, Koji; Hosoda, Yutaka; Kitamura, Toshio; and Kudo, Eiichi, 4,348,485, Cl. 501-115.000.

Hosono, Saburo, to Olympus Optical Co., Ltd. Structure for preventing the breakage of end portions of a protective covering for the adjustable bend section of an endoscope. 4,347,837, Cl. 128-6.000.

Hospal Medical Corporation: *See—*
Haverland, William H.; and Hiler, Albert R., 4,347,718, Cl. 66-84.00A.

Hossfeld, William R. Self-burying anchor system. 4,347,802, Cl. 114-295.000.

Hou, Ching T., to Exxon Research and Engineering Co. Production of epoxides such as propylene oxide using packed catalytic bed containing moist resting cells exhibiting oxygenase activity. 4,348,476, Cl. 435-123.000.

House Food Industrial Company Limited: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; and Kimura, Takashi, 4,348,421, Cl. 426-394.000.

Howell, Edward K., to General Electric Company. Ground fault circuit interrupting device with improved coordination of electronic circuit operation. 4,348,708, Cl. 361-45.000.

Hruda, Robert M., to Westinghouse Electric Corp. Low-voltage vacuum switch operating mechanism. 4,348,567, Cl. 200-144.00B.

Hsieh, Shao-Chung, to General Motors Corporation. Printed circuit connector. 4,348,071, Cl. 339-75.0MP.

Hu, Daniel C.: *See—*
Allen, Bert L.; Wourms, Robert L.; and Hu, Daniel C., 4,347,654, Cl. 29-576.00B.

Huang, Ho-Chung: *See—*
Subbarao, Saligrama N.; and Huang, Ho-Chung, 4,348,253, Cl. 156-643.000.

Huang, John C., to Minnesota Mining and Manufacturing Company. Method for coating with radially-propagating, free, liquid sheets. 4,348,432, Cl. 427-402.000.

Huang, Victor K.: *See—*
Blahut, Donald E.; Huang, Victor K.; and Townsend, Richard L., Jr., 4,348,720, Cl. 364-200.000.

Hubbard, Vance M.; and Brunson, Welton K., to Tecnol, Inc. Small ice pack. 4,347,848, Cl. 128-402.000.

Huber, Siegfried, to Black & Decker Inc. Printed-circuit board and trigger-switch arrangement for a portable electric tool. 4,348,603, Cl. 310-50.000.

Hubner, Hans: *See—*
Blahak, Johannes; Hubner, Hans; Koster, Johannes; Meiners, Hans J.; and Thomas, Heinz, 4,348,536, Cl. 560-169.000.

Huck Manufacturing Company: *See—*
Smith, Walter J., 4,347,728, Cl. 72-391.000.

Huettner, Robert E.: *See—*
Farrell, Robert J.; Coit, Kenneth T.; Vernon, John H.; Yu, Kin C.; Huettner, Robert E.; and Grandmaison, John P., 4,348,725, Cl. 364-300.000.

Huffman, George W.: *See—*
Akerberg, Denis W.; Huffman, George W.; and Rude, Carl A., 4,348,343, Cl. 264-29.500.

Hughes Aircraft Company: *See—*
Schmitz, Lawrence S., 4,348,745, Cl. 365-154.000.
Tangonan, Gregory L.; Morrison, Robert J.; Wysocki, Joseph A.; and Persechini, David L., 4,348,587, Cl. 250-227.000.

Human Oltoanyagtermelo es Kutato Intezet: *See—*
Benyo, Janos; Papp, Tibor; and Tolnay, Janos, 4,347,841, Cl. 128-156.000.

Husslein, Gerd; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Preparation of 2-aryloxy-2-halopropionic acid compounds. 4,348,534, Cl. 560-62.000.

Hutchinson-Mapa: *See—*
Domer, Michel, 4,348,015, Cl. 267-140.400.

Huxley, Edward E.: *See—*
Gordon, Bruce W.; and Huxley, Edward E., 4,348,214, Cl. 55-48.000.

Hybrid Technology Corporation: *See—*
Spigarelli, Donald J., 4,348,174, Cl. 432-1.000.

Hyldal, Jorgen, to Danfoss A/S. Control circuit for a multi-phase load. 4,348,621, Cl. 318-254.000.

I.C.E. Company, Inc.: *See—*
Pierson, William V., 4,347,824, Cl. 123-527.000.

Iannadrea, Gerald M.: *See—*
Gorgone, Robert L.; Iannadrea, Gerald M.; Doleja, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,348,656, Cl. 340-146.30R.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Glass door merchandizer with tertiary air band. 4,347,710, Cl. 62-155.000.

Ichizuka, Kiyomi: *See—*
Kozima, Akio; Akutsu, Eiichi; and Ichizuka, Kiyomi, 4,348,470, Cl. 430-72.000.

Igarashi, Osamu; Kugo, Masaru; and Watanabe, Shizuhisa, to Hitachi, Ltd. Method of controlling automobile equipment and control apparatus. 4,348,726, Cl. 364-424.000.

Igashira, Toshihiko: *See—*
Nomura, Ken; Igashira, Toshihiko; and Abe, Seikou, 4,347,826, Cl. 123-549.000.

Iizuka, Yutaka, to Nippon Kogaku K.K. Inverted Galilean finder. 4,348,090, Cl. 354-224.000.

Iizuka, Yutaka, to Nippon Kogaku K.K. Indicator device in an inverted Galilean finder. 4,348,091, Cl. 354-225.000.
Ikin, John B.: *See—*
Neale, Denis M.; Bontoft, Frederick J.; and Ikin, John B., 4,348,114, Cl. 356-431.000.
Ilmer, Andreas, to BASF Aktiengesellschaft. VTR With equalizer. 4,348,692, Cl. 358-127.000.
Imai, Hironobu, to NSK-Warner K.K. Webbing take-up device. 4,347,992, Cl. 242-68.400.
Imai, Hiroshi: *See—*
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yochiteru; Kanno, Masayoshi; Kuniya, Jiro; and Itow, Hisao, to Hitachi, Ltd. Butt welded tubular structure of austenite stainless steel. 4,348,041, Cl. 285-286.000.
Imai, Masafumi: *See—*
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,348,507, Cl. 526-125.000.
Imai, Mithuo: *See—*
Takada, Yukihiro; Sugiyama, Kimikazu; and Imai, Mithuo, 4,347,787, Cl. 101-333.000.
Imai, Yoshio: *See—*
Kawamatsu, Yutaka; Sohda, Takashi; and Imai, Yoshio, 4,348,403, Cl. 424-270.000.
Imanaka, Yoshihiko; Saito, Yoichi; and Horike, Akihiro, to Teijin Limited. Abrasion-resistant laminated film. 4,348,456, Cl. 428-336.000.
Imondi, Anthony R.; and Shemano, Irving, to Adria Laboratories, Inc. Orally active tolciclate and tolnaftate. 4,348,407, Cl. 424-300.000.
Imperial Chemical Industries Limited: *See—*
Edwards, Philip N.; and Martin, David M. G., 4,348,322, Cl. 549-296.000.
Ginger, Rodney E.; and Jungesblut, Manfred, 4,347,931, Cl. 206-438.000.
Inaba, Hajimu: *See—*
Kobayashi, Kengo; Inaba, Hajimu; and Sakakibara, Shinsuke, 4,348,623, Cl. 318-568.000.
Inaba, Naomi: *See—*
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,348,507, Cl. 526-125.000.
Indianapolis Center for Advanced Research, Inc.: *See—*
Kelly-Fry, Elizabeth; Fry, Francis J.; and Gardner, George W., 4,347,850, Cl. 128-660.000.
Ingersoll-Rand Company: *See—*
Goehler, Robert F., 4,348,134, Cl. 404-129.000.
Inghram, Donald M.; and Walker, William B., to FMC Corporation. Mobile cargo handling system and method. 4,348,150, Cl. 414-529.000.
Inland Steel Company: *See—*
Brown, Birchel S.; Myers, Ted L.; and Easter, Holton C., 4,347,724, Cl. 72-203.000.
Innovation Enterprises, Inc.: *See—*
Fariss, James D., Jr., 4,347,883, Cl. 145-61.00R.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,348,622, Cl. 318-318.000.
Inoue, Jiro, to Murata Manufacturing Co., Ltd. Piezoelectric vibrator with spurious mode suppression. 4,348,609, Cl. 310-367.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. DC Motor drive control system. 4,348,622, Cl. 318-318.000.
Inoue, Mitsumasa: *See—*
Saito, Masaaki; Kawamura, Yoshihisa; Sugo, Yuko; and Inoue, Mitsumasa, 4,347,816, Cl. 123-308.000.
Inoue, Takayuki; and Iwasa, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. System for manufacturing connection wires. 4,347,651, Cl. 29-33.00M.
Inoue, Yukio: *See—*
Yoshinaga, Shoji; Kawano, Hirosige; Todo, Matsuzo; Takahasi, Tosihiko; Fujiwara, Kiyoshi; and Inoue, Yukio, 4,348,288, Cl. 210-708.000.
Institut de Recherches de la Siderurgie Francaise: *See—*
Grosjean, Jean-Claude; and Grave, Roland, 4,348,013, Cl. 266-220.000.
Institute Po Microbiologia: *See—*
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,348,481, Cl. 435-234.000.
Intercollection Development SA: *See—*
Strassle, Alex, 4,348,053, Cl. 297-445.000.
International Business Machines Corporation: *See—*
Abbott, Clinton E.; and Rice, Larry J., 4,348,123, Cl. 400-298.000.
Ainscow, Frank, 4,348,688, Cl. 358-29.000.
Baker, James K.; and Baker, Janet M., 4,348,553, Cl. 179-1.0SB.
Brereton, David A.; and Stansbury, Buddy F., 4,348,721, Cl. 364-200.000.
Cukier, Maurice; and Sellier, Daniel, 4,348,737, Cl. 364-900.000.
Deaver, Randall L.; Freund, Thomas J.; and Gerstle, Patrick J., 4,348,739, Cl. 364-900.000.
Desai, Kamalesh S.; and Melvin, George E., 4,347,735, Cl. 73-73.000.
Galwey, Ronald K.; and Kanazawa, Kay K., 4,348,632, Cl. 323-280.000.
Hassan, Javathu K.; and Paivanas, John A., 4,348,139, Cl. 406-10.000.
Lebesnerais, Gerard M., 4,348,595, Cl. 307-221.00R.
Rice, Larry J., 4,348,124, Cl. 400-298.000.
Schnurmann, Henri D., 4,348,759, Cl. 371-20.000.
Sweat, Robert H., Jr.; and Thornhill, William J., 4,347,786, Cl. 101-93.030.
Weinberger, Arnold, 4,348,736, Cl. 364-787.000.
International Flavors & Fragrances Inc.: *See—*
Boden, Richard M., 4,347,857, Cl. 131-276.000.
Boden, Richard M., 4,348,416, Cl. 426-3.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,347,858, Cl. 131-276.000.
International Harvester Co.: *See—*
Meisner, David B.; and Vacval, Dusan M., 4,348,055, Cl. 298-23.0DF.
International Minerals & Chemical Corp.: *See—*
Young, Vernon V.; and Bright, David R., 4,348,389, Cl. 424-228.000.
International Spike, Inc.: *See—*
Bond, Allen M., Jr., 4,348,218, Cl. 71-1.000.
International Standard Electric Corporation: *See—*
Head, Brian E., 4,347,658, Cl. 29-602.00R.
Oldham, Ronald C., 4,348,076, Cl. 350-96.220.
Schlayer, Wolfgang; and Hemminger, Herbert, 4,348,017, Cl. 269-296.000.
Sutherland, Joseph E., 4,348,758, Cl. 370-110.200.
International Telephone and Telegraph Corporation: *See—*
Svala, Carl G., 4,348,768, Cl. 375-26.000.
Inventio AG: *See—*
Schroder, Joris, 4,347,916, Cl. 187-95.000.
Iovino, Jerry. Erase attachment for tape cassettes. 4,348,700, Cl. 360-60.000.
Ipco Corporation: *See—*
Dawson, Peter E., 4,348,181, Cl. 433-172.000.
Weissman, Bernard, 4,348,183, Cl. 433-221.000.
Isaka, Masayoshi: *See—*
Nakamura, Kiyoshi; and Isaka, Masayoshi, 4,348,618, Cl. 318-38.000.
Iseki, Kazuo, to Ohta Company Limited. Self closing hinge. 4,347,645, Cl. 16-291.000.
Ishida, Masahide: *See—*
Nakatani, Hiroshi; Ishida, Masahide; and Yamamoto, Hachizou, 4,348,551, Cl. 179-1.0SM.
Ishida, Toshihiko; and Tanaka, Kimio, to TDK Electronics Co., Ltd. Case for holding magnetic tape cassette. 4,347,933, Cl. 206-387.000.
Ishii, Yoshitomo: *See—*
Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, 4,348,226, Cl. 75-35.000.
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Ohara, Wataru, to Oki Electric Industry Co. Ltd.; and Nippon Telegraph & Telephone Public Corporation. Printing head for a dot printer. 4,348,120, Cl. 400-124.000.
Isolite Babcock Refractories Co., Ltd.: *See—*
Kato, Takeo, 4,348,441, Cl. 428-49.000.
Isono, Teizo: *See—*
Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, 4,348,201, Cl. 8-94.180.
Issenmann, Olivier. Apparatus for burning crude oil. 4,348,171, Cl. 431-202.000.
Itakura, Hideaki: *See—*
Toyoda, Hiroyasu; Komiya, Hiroyoshi; and Itakura, Hideaki, 4,348,577, Cl. 219-121.0PE.
Ito, Tatsuo, to Fujitsu-Ten, Ltd. Manual channel selection apparatus. 4,348,770, Cl. 455-164.000.
Ito, Tetsuo, to Hitachi, Ltd. Charging current integrating type photodetectors. 4,348,110, Cl. 356-328.000.
Ito, Yoji: *See—*
Tsuzuki, Yoshihiko; Okazaki, Hiroshi; Shirasaki, Shinji; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,348,653, Cl. 340-52.00F.
Itoh, Kaoru: *See—*
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,348,751, Cl. 368-82.000.
Itoi, Toru. Outerwear used both as jacket and bag. 4,347,629, Cl. 2-108.000.
Itoki Co., Ltd.: *See—*
Takamatsu, Shunichi, 4,348,152, Cl. 414-785.000.
Itow, Hisao: *See—*
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yochiteru; Kanno, Masayoshi; Kuniya, Jiro; and Itow, Hisao, 4,348,041, Cl. 285-286.000.
ITT Industries, Inc.: *See—*
Bauer, Kurt; and Roth, Christian, 4,347,642, Cl. 15-250.350.
Belart, Juan, 4,347,779, Cl. 91-369.00A.
Goertler, Horst; Hetzel, Friedrich; Prohaska, Hans; Rachner, Horst; Seitter, Wolf; and Swoboda, Josef, 4,348,655, Cl. 340-73.000.
Kohler, Alfred; and Prohaska, Hans, 4,347,641, Cl. 15-250.350.
Ivinger, Kjell E. G., to Granges Aluminium AB. Apparatus for dividing strip material. 4,347,959, Cl. 225-97.000.
Iwasa, Tatsuya: *See—*
Inoue, Takayuki; and Iwasa, Tatsuya, 4,347,651, Cl. 29-33.00M.
Iwasaki, Motoaki: *See—*
Matsuda, Akira; Hayakawa, Yoshihiro; Yasuda, Shigeo; and Iwasaki, Motoaki, 4,348,654, Cl. 340-58.000.

Iwasaki, Yuhei: *See—*
Kimura, Seiichiro; Iwasaki, Yuhei; and Kozaki, Yuji, 4,348,592, Cl. 250-560.000.
J. C. Penney Company, Inc.: *See—*
Lucchesi, Armand P., 4,348,661, Cl. 340-510.000.
J. Connell Associates: *See—*
Bowling, James T., 4,348,061, Cl. 301-37.00R.
Jack, Stanton E.: *See—*
O'Dette, John H.; and Jack, Stanton E., 4,348,242, Cl. 149-7.000.
Jackson, Barry N.: *See—*
Gammons, Clifford E.; Moore, Francis C.; Pagel, Kenneth L.; and Jackson, Barry N., 4,347,633, Cl. 5-453.000.
Jackson, Byron L., to Robertshaw Controls Company. Internal combustion engine coolant system, thermostat therefor and methods of making the same. 4,347,973, Cl. 236-34.500.
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, to L'Oreal. Cosmetic compositions for the hair and skin based on copolymers having tertiary amine and/or quaternary ammonium functions. 4,348,380, Cl. 424-47.000.
Jadlocki, Joseph F., Jr.: *See—*
Thompson, John S.; and Jadlocki, Joseph F., Jr., 4,348,419, Cl. 426-264.000.
Jagt, Jannes C., to U.S. Philips Corporation. Method of applying a layer in accordance with a pattern on a substrate, a negative resist material and a substrate coated with the resist. 4,348,472, Cl. 430-195.000.
Jakobsen, Jakob S., to Danfoss A/S. Regulating circuit for the valve of a refrigeration plant. 4,347,976, Cl. 236-68.00B.
Jakubowski, Thaddeus, Jr.; Lockhart, Jess W.; and Robinson, Norman F., to McDonnell Douglas Corporation. Rack with compliant wedge actuated swaybraces. 4,347,777, Cl. 89-1.50G.
Jamerson, Jackie D.: *See—*
Billig, Ernst; Jamerson, Jackie D.; and Pruett, Roy L., 4,348,539, Cl. 568-454.000.
James, David I.: *See—*
Gale, George M.; James, David I.; and Meyer, John V. B., 4,348,584, Cl. 219-549.000.
Jandy Industries, Inc.: *See—*
Pansini, Andrew L., 4,348,192, Cl. 440-38.000.
Janosi, Marcell, to Budapesti Radiotechnikai Gyar. Flexible magnetic disc having track marking information recorded thereon. 4,348,703, Cl. 360-77.000.
Jaouannet, Alain; Henaff, Louis G.; and Ramy, Jean-Pierre R. Writing head for an electrostatic point printer. 4,348,685, Cl. 346-155.000.
Japan Bano'k Co. Ltd.: *See—*
Furutu, Akira, 4,347,932, Cl. 206-343.000.
Jarboe, Charles H.: *See—*
May, David C.; and Jarboe, Charles H., 4,348,397, Cl. 424-253.000.
Jarecki, Leszek: *See—*
Meier, Dale J.; and Jarecki, Leszek, 4,348,350, Cl. 264-570.000.
Jarrett, Robert B.; and Pace, Wilson D., to Motorola, Inc. Controlled current source for I^2L to analog interfaces. 4,348,600, Cl. 307-475.000.
Jastrzebski, Lubomir L.; and Levine, Peter A., to RCA Corporation. Semiconductor imagers. 4,348,690, Cl. 358-44.000.
Jenkins, Fred W., to Petrolite Corporation. Zirconium compounds as flotation aid. 4,348,287, Cl. 210-705.000.
Jenoptik Jena GmbH: *See—*
Stegmann, Horst; Meyl, Wolfgang; and Hentschel, Peter, 4,347,739, Cl. 73-170.00R.
Jensen, Bruce A., to Phillips Petroleum Company. Control of sidedraw on distillation column. 4,348,259, Cl. 203-1.000.
Jernberg, Robert H.; and Barton, Edwin A., to Pressure-Pak Container Co., Inc. Pressure relief device and method of fabrication thereof. 4,347,942, Cl. 220-89.00A.
Jessop, Edward S.: *See—*
Butler, Nora; Jessop, Edward S.; and Kolb, John R., 4,348,504, Cl. 525-477.000.
Jewett, Mark D., to Massey-Ferguson, Inc. Locking differential control system. 4,347,760, Cl. 74-710.500.
Jidosha Seiko Co., Ltd.: *See—*
Hori, Masaki; and Hori, Hisashi, 4,348,045, Cl. 296-14.000.
Jindra, Clifford P.: *See—*
Atherton, James H.; and Jindra, Clifford P., 4,348,596, Cl. 307-264.000.
Jogand, Patrick: *See—*
Artaud, Robert; Aubert, Michel; Elbeze, Richard; and Jogand, Patrick, 4,348,354, Cl. 376-405.000.
Johansson, Folke, to ASEA Aktiebolag. Diverter switch for an on-load transformer tap changer. 4,348,558, Cl. 200-6.00R.
Johansson, Sigvard; and Pearson, Wells R. S., to Gnosjoplast Aktiebolag. Pallet collar. 4,347,941, Cl. 220-6.000.
Johnson, Ardell W. Rock box. 4,348,153, Cl. 414-786.000.
Johnson, Don R., to Harris & Thrush Manufacturing Company. Module dump. 4,347,696, Cl. 56-16.600.
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., to Phillips Petroleum Company. Ammonia synthesis with catalyst derived by heating on a support a salt selected from alkali metal, alkaline earth metal, iron and cobalt hexacyanocobaltates and hexacyanoruthenates. 4,348,370, Cl. 423-362.000.
Johnson, Paul H., to Phillips Petroleum Company. Carbon black recovery. 4,348,361, Cl. 422-150.000.
Johnson, Richard V., to Xerox Corporation. Acousto-optic device utilizing Fresnel zone plate electrode array. 4,348,079, Cl. 350-358.000.
Johnston, David B. R.: *See—*
Bouffard, F. Aileen; Christensen, Burton G.; and Johnston, David B. R., 4,348,320, Cl. 260-239.00A.
Johnston, David E., to George Angus & Company Limited. Toggle-action face seal for relatively rotatable members. 4,348,030, Cl. 277-40.000.
Johnston, David E., to George Angus & Company Limited. Rotary fluid seals with floating sealing rings. 4,348,031, Cl. 277-83.000.
Johnston, Harry R. Devices for use in aligning axles. 4,347,668, Cl. 33-193.000.
Jolenn Energy Products Ltd.: *See—*
Muller, John E., 4,347,817, Cl. 123-325.000.
Jones, Marvin R., to Cameron Iron Works, Inc. Shear ram blowout preventer. 4,347,898, Cl. 166-55.000.
Jones, Otto G., to Certain-teed Corporation. Package of wound strand material. 4,348,439, Cl. 428-36.000.
Joormann, Hendrik J. M.; Verweij, Hendrik; and Haisma, Jan, to U.S. Philips Corporation. Precision pressed glass object, glass, method of preparing glass. 4,348,484, Cl. 501-45.000.
Joseph, Joseph P.: *See—*
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,348,527, Cl. 548-362.000.
Joy Manufacturing Company: *See—*
Novoselac, John, 4,347,971, Cl. 233-20.00R.
Wright, David; and Hawkes, Ivor, 4,348,635, Cl. 324-52.000.
Jundanian, Richard H., to Blodgett, Norman S.; and Blodgett, Gerry A., part interest to each. Vital signs monitor. 4,347,851, Cl. 128-668.000.
Jung, Liebhard: *See—*
Claussen, Reimer; and Jung, Liebhard, 4,347,753, Cl. 74-110.000.
Jungesblut, Manfred: *See—*
Ginger, Rodney E.; and Jungesblut, Manfred, 4,347,931, Cl. 206-438.000.
Kabushiki Kaisha Cubic Engineering: *See—*
Nakanishi, Motoyasu, 4,348,246, Cl. 156-73.100.
Kabushiki Kaisha Mino Seisakusho: *See—*
Mino, Masao; and Ohno, Takeshi, 4,347,991, Cl. 242-43.200.
Kabushiki Kaisha Nippon Coinco: *See—*
Hayashi, Yukichi; Sugimoto, Osamu; and Yokohda, Yutaka, 4,347,860, Cl. 133-1.00R.
Sugimoto, Osamu; and Akagawa, Masaki, 4,347,925, Cl. 194-1.00N.
Kabushiki Kaisha Saginomiya Seisakusho: *See—*
Kaneko, Morio, 4,347,977, Cl. 236-92.00B.
Kaestner, Eugene D. Gill net hauling and fish removing system. 4,347,680, Cl. 43-10.000.
Kamal, Nabil. Reversed moving die folding and creasing machine. 4,347,955, Cl. 223-38.000.
Kameno, Yoshito: *See—*
Kojima, Shinichi; Koide, Ten; Ogino, Shigeo; Tsuchiya, Toshiro; and Kameno, Yoshito, 4,348,386, Cl. 424-177.000.
Kamihigoshi, Tsutomu: *See—*
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,348,363, Cl. 422-192.000.
Kamimura, Yasushi. Crime preventive door viewer. 4,348,083, Cl. 350-453.000.
Kamio, Hiroyoshi; Ogino, Yukio; and Nakamura, Kouichi, to Nippon Mining Company, Limited. Accelerated hardening of unsaturated polyester resins. 4,348,498, Cl. 525-13.000.
Kamiya, Shingo, to Nippon Gakki Seizo Kabushiki Kaisha. Power amplifying circuit with changing means for supply voltage. 4,348,644, Cl. 330-297.000.
Kammer, Paul A.; and Durmann, George J., to Eutectic Corporation. Flame spray powder. 4,348,433, Cl. 427-423.000.
Kammer, Paul A.; Yurasko, George, Jr.; and Zmrzlik, Karel, to Eutectic Corporation. Flame spray powder. 4,348,434, Cl. 427-423.000.
Kampe, Wolfgang: *See—*
Friebe, Walter-Gunar; Kampe, Wolfgang; Thiel, Max; Schaumann, Wolfgang; and Wilhelms, Otto-Henning, 4,348,401, Cl. 424-267.000.
Kanai, Chiaki: *See—*
Tsuchiya, Yoshikazu; Tanaka, Masato; Sonoda, Takenori; Watanabe, Tetsu; Kanai, Chiaki; and Watanabe, Nobuhiko, 4,348,699, Cl. 360-32.000.
Kanayama, Katsumi; Furuta, Kenzi; and Motoyama, Kazuyasu, to Olympus Optical Co., Ltd. Mode switching circuit. 4,348,701, Cl. 360-61.000.
Kanazawa, Kay K.: *See—*
Galwey, Ronald K.; and Kanazawa, Kay K., 4,348,632, Cl. 323-280.000.
Kaneko, Dentaro: *See—*
Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, 4,348,226, Cl. 75-35.000.
Kaneko, Morio, to Kabushiki Kaisha Saginomiya Seisakusho. Temperature responsive expansion valve. 4,347,977, Cl. 236-92.00B.
Kanno, Masayoshi: *See—*
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yochiteru; Kanno, Masayoshi; Kuniya, Jiro; and Itow, Hisao, 4,348,041, Cl. 285-286.000.
Kantner, Harold H.; and Scott, Stephen D., to Transcience Associates, Inc. Direct-drive hydraulic pump-motor. 4,347,700, Cl. 60-325.000.
Kao Soap Co., Ltd.: *See—*
Ohki, Kenji; Tokuyama, Mistru; Sagae, Masayuki; and Kawabuchi, Kenji, 4,347,844, Cl. 128-287.000.
Tsutsumi, Hisao; Hori, Kazumi; and Kawano, Junichi, 4,348,415, Cl. 424-365.000.

Kara, an: *See*—
Pavek, Miloslav; Novacek, Miroslav; Fantl, Jiri; Kara, an; and Kasparek, Zdenek, 4,347,649, Cl. 28-254.000.
Karbowski, James P., to Triple Dee Electronics Inc. Transmitter-receiver loop buried metal object locator with switch controlled reference voltage. 4,348,639, Cl. 324-329.000.
Karl Lautenschlager KG Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl; and Lautenschlager, Gerhard W., 4,347,644, Cl. 16-50.000.
Lautenschlager, Karl, 4,348,130, Cl. 403-231.000.
Karrer, Friedrich; and Moser, Paul, to Ciba-Geigy Corporation. Amide derivatives of polyalkylpiperidines. 4,348,524, Cl. 546-187.000.
Kasparek, Zdenek: *See*—
Pavek, Miloslav; Novacek, Miroslav; Fantl, Jiri; Kara, an; and Kasparek, Zdenek, 4,347,649, Cl. 28-254.000.
Katayama, Hitomi: *See*—
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.
Kato Hatsujo Kaisha Limited: *See*—
Sato, Toshio; and Ogawa, Yasuyuki, 4,347,999, Cl. 248-73.000.
Kato, Katsuhiro: *See*—
Okamoto, Fumio; and Kato, Katsuhiro, 4,348,299, Cl. 252-301.40S.
Kato, Keizo: *See*—
Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,348,461, Cl. 428-409.000.
Kato, Takeo, to Isolite Babcock Refractories Co., Ltd. Fibrous insulating material and insulating wall. 4,348,441, Cl. 428-49.000.
Katsuma, Makoto; Shinbori, Kenichi; Kiuchi, Masayoshi; and Alyfuku, Kiyoshi, to Canon Kabushiki Kaisha. Sound mode selector device in a camera incorporating a buzzer. 4,348,096, Cl. 354-289.000.
Katsuno, Yasumitsu: *See*—
Kojima, Tomonori; and Katsuno, Yasumitsu, 4,348,359, Cl. 422-76.000.
Kauffmann, Russell E. Disc game apparatus. 4,348,026, Cl. 273-126.00R.
Kawabuchi, Kenji: *See*—
Ohki, Kenji; Tokuyama, Mistru; Sagae, Masayuki; and Kawabuchi, Kenji, 4,347,844, Cl. 128-287.000.
Kawaguchi, Hatsuo: *See*—
Kunioka, Saburo; Kawaguchi, Hatsuo; and Ono, Minoru, 4,348,241, Cl. 148-6.350.
Kawaishi, Yasunori: *See*—
Suzuki, Shigeru; Ohno, Yukihiro; Yanagawa, Nobuyuki; and Kawaishi, Yasunori, 4,348,106, Cl. 355-75.000.
Kawamatsu, Yutaka; Sohda, Takashi; and Imai, Yoshio, to Takeda Chemical Industries, Ltd. 2-Amino-4-(4-benzyloxyphenyl)thiazoles, and their use in hyperlipemia. 4,348,403, Cl. 424-270.000.
Kawamura, Yoshihisa: *See*—
Saito, Masaaki; Kawamura, Yoshihisa; Sugo, Yuko; and Inoue, Mitsumasa, 4,347,816, Cl. 123-308.000.
Kawano, Hirosige: *See*—
Yoshinaga, Shoji; Kawano, Hirosige; Todo, Matsuzo; Takahasi, Tosihiko; Fujiwara, Kiyoshi; and Inoue, Yukio, 4,348,288, Cl. 210-708.000.
Kawano, Junichi: *See*—
Tsutsumi, Hisao; Hori, Kazumi; and Kawano, Junichi, 4,348,415, Cl. 424-365.000.
Kawara, Toshio: *See*—
Yano, Shozo; Miyake, Toshiyuki; Fujinaga, Yasuhiro; Koomoto, Akira; Kawara, Toshio; Yagi, Akio; Tsuji, Tomohiro; and Nagaoka, Tadashi, 4,347,903, Cl. 177-25.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Maeda, Takuya; Yamada, Tsutomu; and Kishimoto, Mitsuharu, 4,348,225, Cl. 75-34.000.
Kawashima, Yoshinori: *See*—
Oonuma, Koichiro; Kawashima, Yoshinori; and Hanai, Toshinori, 4,348,199, Cl. 474-156.000.
Kawazu, Hideyuki; and Suzuki, Yoshiro, to Olympus Optical Company Ltd. Cleaning apparatus for photosensitive member of electrophotographic copying machine. 4,348,103, Cl. 355-15.000.
Kazda, Stanislav: *See*—
Franckowiak, Gerhard; Meyer, Horst; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,348,395, Cl. 424-250.000.
Kazi, Abdulla M. Z.: *See*—
Crompton, Charles E.; Kazi, Abdulla M. Z.; and Soni, Inderjit S., 4,348,301, Cl. 252-313.00R.
Keck, Max H.; and Ginnings, Paul R., to Goodyear Tire & Rubber Company, The. Linear block copolyesters having improved slip characteristics. 4,348,510, Cl. 528-26.000.
Keeton, John H. Herbicide row applicator. 4,347,684, Cl. 47-1.500.
Kelder, Jan, to AKZO nv. Novel bis- and mono-quaternary ammonium derivatives of 2β,16β-dipiperidino-5α-androstanes, processes for their preparation and pharmaceutical preparations. 4,348,390, Cl. 424-241.000.
Keller, Roman; and Kliesch, Gunter, to Siemens Aktiengesellschaft. Clamping assembly for thyristor column. 4,348,687, Cl. 357-79.000.
Keller, Ronald L.: *See*—
Brown, Raymond J.; Keller, Ronald L.; and Lang, Charles F., 4,348,366, Cl. 423-111.000.
Kelly-Fry, Elizabeth; Fry, Francis J.; and Gardner, George W., to Indianapolis Center for Advanced Research, Inc. Direct water coupling device for ultrasound breast scanning in a supine position. 4,347,850, Cl. 128-660.000.
Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,348,212, Cl. 55-2.000.
Kenyon, David L. Chain lock. 4,347,720, Cl. 70-14.000.
Kerb, Ulrich: *See*—
Nickolson, Robert; Kerb, Ulrich; Wiechert, Rudolf; Alig, Leo; Furst, Andor; and Muller, Marcel, 4,348,327, Cl. 260-397.100.
Kernforschungsanlage Juich, Gesellschaft mit beschrankter Haftung: *See*—
Dias, Francisco J.; Hannen, Willi; Luhleich, Hartmut; and Pflaum, Peter, 4,347,671, Cl. 34-15.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Groeneweg, Joost; and Schluer, Manfred, 4,348,285, Cl. 210-602.000.
Kerotest Manufacturing Corp.: *See*—
Schmitt, Edward L.; Caroleo, Steven J.; Bolam, Charles W.; and Conley, Richard W., 4,348,006, Cl. 251-288.000.
Kerps, Dietrich: *See*—
Ackley, Donald E.; Engelmann, Reinhart W. H.; and Kerps, Dietrich, 4,348,763, Cl. 372-45.000.
Kersten, Peter; Meixner, Peter; and Muller, Erich, to Veb Schwermachinenbaukombinat Takraf. Bucket-wheel excavator. 4,347,676, Cl. 37-94.000.
Kersten, Siegfried P.: *See*—
Patil, Arvind S.; Kersten, Siegfried P.; and Fliege, Werner P., 4,348,240, Cl. 106-304.000.
Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Injection moldable amide-imide copolymers and terpolymers. 4,348,513, Cl. 528-188.000.
Kessler, David R.; Gutmann, Thomas J.; and Finn, Charles E., to General Motors Corporation. Throttle body injection apparatus with distribution skirt. 4,347,823, Cl. 123-472.000.
Keyes, John T., to Union Tank Car Company. Combined safety vent and siphon unloading nozzle for liquid transportation vehicle. 4,347,863, Cl. 137-212.000.
Kheidr, Mahmoud; and Fraser, Irene A. E., to Tenneco Chemicals, Inc. Liquid, solvent-free, non-toxic stabilizers and vinyl chloride resin compositions containing same. 4,348,494, Cl. 524-114.000.
Khoury, Nick S., to Continental Group, Inc., The. Combination score tool and score anvil. 4,348,464, Cl. 428-571.000.
Kidder, Kenneth B.: *See*—
Benton, Ronald; Kidder, Kenneth B.; Linderberg, Robert L.; Tinsley, Timothy M.; and Westley, Curtis E., 4,347,712, Cl. 62-175.000.
Kienitz, Lutz: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, 4,348,334, Cl. 260-505.00C.
Kierstead, Richard W.; and Tilley, Jefferson W., to Hoffmann-La Roche Inc. Substituted 11-oxo-11H-pyrido[2,1-b]quinazolines and method of inhibiting allergic reactions with them. 4,348,396, Cl. 424-251.000.
Kikuchi, Hiroshi: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Ohara, Wataru, 4,348,120, Cl. 400-124.000.
Kikuchi, Takehiro: *See*—
Kobayashi, Akio; Kikuchi, Takehiro; Kondo, Toshio; and Tajima, Masahiko, 4,348,727, Cl. 364-431.060.
Kim, Leo: *See*—
Sanders, Andrea; and Kim, Leo, 4,348,509, Cl. 562-538.000.
Kimura, Seiichiro; Iwasaki, Yuhei; and Kozaki, Yuji, to Nippon Seiko Kabushiki Kaisha. Apparatus for reading patterns. 4,348,592, Cl. 250-560.000.
Kimura, Takashi: *See*—
Sakakibara, Sakuichi; Sugisawa, Ko; and Kimura, Takashi, 4,348,421, Cl. 426-394.000.
Kinast, Gunther; Muller, Lutz; Sitt, Rudiger; and Puls, Walter, to Bayer Aktiengesellschaft. 2-Hydroxyalkyl-3,4,5-trihydroxy-piperidine compounds, their production and their medicinal use. 4,348,402, Cl. 424-267.000.
King, Paul V.; Becher, Albert P.; and Henderson, Wilmer P., to United States of America, Army. Blast suppressive shielding. 4,347,796, Cl. 109-49.500.
King, Peter F., to Occidental Chemical Corporation. One package replenisher for aluminum cleaner. 4,348,294, Cl. 252-142.000.
Kinsell, Robert C.; and Noe, James C., to Garrett Corporation, The. Heat pump systems for residential use. 4,347,714, Cl. 62-402.000.
Kinsella, John E.; and Shetty, Jayarama K., to Cornell Research Foundation, Inc. Recovery of proteinaceous material having reduced nucleic acid levels. 4,348,479, Cl. 435-183.000.
Kirchoff, George F.: *See*—
Law, Bliss W.; Kirchoff, George F.; and Adams, Gary V., 4,348,037, Cl. 280-733.000.
Kirihara, Seishin: *See*—
Shimanuki, Shizuka; Matsumoto, Toshimi; Sato, Hiroshi; Onuma, Tsutomu; and Kirihara, Seishin, 4,348,131, Cl. 403-272.000.
Kishi, Mitsuhiro. Lifting apparatus. 4,348,008, Cl. 254-122.000.
Kishimoto, Mitsuharu: *See*—
Maeda, Takuya; Yamada, Tsutomu; and Kishimoto, Mitsuharu, 4,348,225, Cl. 75-34.000.
Kishimoto, Toshio: *See*—
Fujii, Osamu; Kishimoto, Toshio; Kosuge, Hisao; and Nagamine, Ryoji, 4,348,164, Cl. 425-89.000.
Kita, Yasuo, to Sumitomo Electric Industries, Ltd. Floating type disc brake. 4,347,917, Cl. 188-73.450.

Kitagishi, Nozomu; and Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Tele-photographic lens of large aperture ratio. 4,348,084, Cl. 350-454.000.

Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Exhaust cleaning fluid control system and vacuum control valve device for use therein. 4,347,699, Cl. 60-290.000.

Kitamura, Toshio: *See*—
Oohasi, Koji; Hosoda, Yutaka; Kitamura, Toshio; and Kudo, Eiichi, 4,348,485, Cl. 501-115.000.

Kitamura, Yoshishige, to Nippon Electric Co., Ltd. Buffer circuit. 4,348,601, Cl. 307-530.000.

Kitsukawa, Kazumi: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,348,308, Cl. 524-110.000.

Kittel, Ludwig, to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH. Circuitry for extraction of a transmission clock signal from-modulated data transmissions. 4,348,769, Cl. 375-28.000.

Kiuchi, Masayoshi: *See*—
Katsuma, Makoto; Shinbori, Kenichi; Kiuchi, Masayoshi; and Alyfuku, Kiyoshi, 4,348,096, Cl. 354-289.000.

Kizaki, Yoshio: *See*—
Shiun, Toshimi; Fujii, Hideo; and Kizaki, Yoshio, 4,348,762, Cl. 371-47.000.

Klank, Otto; Rottmann, Dieter; and Wossner, Helmut, to Licentia Patent-Verwaltungs-G.m.b.H. Digital tuning system for a radio receiver. 4,348,771, Cl. 455-180.000.

Klauke, Erich: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.
Kuhle, Engelbert; Kraus, Peter; and Klauke, Erich, 4,348,411, Cl. 424-319.000.
Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; Gallenkamp, Bernd; and Klauke, Erich, 4,348,538, Cl. 562-459.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,348,394, Cl. 424-248.570.

Klein, Fred T.: *See*—
Walker, Starnes E.; and Klein, Fred T., 4,348,115, Cl. 356-436.000.

Kleiner, Fredric: *See*—
Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., 4,347,707, Cl. 62-69.000.

Kleinewefers GmbH: *See*—
Pav, Josef; Hartwich, Gerhard; and Prey, Jorg, 4,347,784, Cl. 100-162.00R.

Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Use of carboalkoxy alkyl norbornanes for augmenting or enhancing the aroma or taste of a smoking tobacco composition or at least a portion of a smoking tobacco article. 4,347,858, Cl. 131-276.000.

Kliesch, Gunter: *See*—
Keller, Roman; and Kliesch, Gunter, 4,348,687, Cl. 357-79.000.

Kling, John E.: *See*—
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,348,209, Cl. 23-232.00R.

Kmetz, Richard C.: *See*—
Ferris, Theodore V.; and Kmetz, Richard C., 4,348,540, Cl. 568-472.000.

Knarr, John E.: *See*—
Clyne, Arthur J.; Knarr, John E.; and Miller, Stanley, 4,347,892, Cl. 165-10.000.

Knecht, Max, to Sulzer Brothers Limited. Rack for intermediate storage of nuclear reactor fuel element bundles. 4,348,352, Cl. 376-272.000.

Knoop, Heinrich; and Pfeiffer, Heinrich, to Maschinenfabrik J. Dieffenbacher GmbH & Co. Device for the insertion and extraction of a laminating pack in and from a press. 4,348,252, Cl. 156-538.000.

Knox, Bruce R.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,348,656, Cl. 340-146.30R.

Kobayashi, Akio; Kikuchi, Takehiro; Kondo, Toshio; and Tajima, Masahiko, to Nippondenso Co., Ltd. Air-fuel ratio control apparatus. 4,348,727, Cl. 364-431.060.

Kobayashi, Kengo; Inaba, Hajimu; and Sakakibara, Shinsuke, to Fujitsu Fanuc Limited. Numerical control system for controlling both a machine tool and a robot. 4,348,623, Cl. 318-568.000.

Kobayashi, Masanobu: *See*—
Tsuzuki, Yoshihiko; Okazaki, Hiroshi; Shirasaki, Shinji; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,348,653, Cl. 340-52.00F.

Kobe Steel, Ltd.: *See*—
Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, 4,348,226, Cl. 75-35.000.

Kobuke, Takayoshi: *See*—
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Kobzina, John W., to Chevron Research Company. Herbicidal N-haloacetyl-2-alkyl-6-acylanilines. 4,348,222, Cl. 71-118.000.

Kochs Adler AG: *See*—
Scholl, Hans; and Fischer, Jochen, 4,347,797, Cl. 112-121.120.

Kodama, Tadasi: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Ohara, Wataru, 4,348,120, Cl. 400-124.000.

Koenig, James P., to Bendix Corporation, The. Tractor air brake proportioning system. 4,348,062, Cl. 303-6.00C.

Kogawa, Takashi, to Hitachi, Ltd. Automatic working apparatus and method of controlling the same. 4,348,731, Cl. 364-513.000.

Kohler, Alfred; and Prohaska, Hans, to ITT Industries, Inc. Wiper arm. 4,347,641, Cl. 15-250.350.

Koide, Ten: *See*—
Kojima, Shinichi; Koide, Ten; Ogino, Shigeo; Tsuchiya, Toshiro; and Kameno, Yoshito, 4,348,386, Cl. 424-177.000.

Koike, Toshifumi: *See*—
Yoshioka, Masahiro; and Koike, Toshifumi, 4,348,065, Cl. 308-9.000.

Koizumi, Yutaka, to Ricoh Company, Ltd. Electrophotographic apparatus. 4,348,098, Cl. 355-3.0TR.

Kojima, Shinichi; Koide, Ten; Ogino, Shigeo; Tsuchiya, Toshiro; and Kameno, Yoshito, to Sumitomo Chemical Company, Limited. Protease inhibitors. 4,348,386, Cl. 424-177.000.

Kojima, Tomonori; and Katsuno, Yasumitsu, to Mitsubishi Chemical Industries, Limited. Device for determining various types of trace nitrogen. 4,348,359, Cl. 422-76.000.

Kokorowski, Stanislaw A., to United States of America, Air Force. Automatic bandwidth control system. 4,348,586, Cl. 250-214.00R.

Kolb, Gunter: *See*—
Lobach, Wilfried; Kolb, Gunter; Lehmann, Wolfgang; Cramm, Gunther; Muller, Friedhelm; and Muszik, Janos, 4,348,514, Cl. 528-367.000.

Kolb, John R.: *See*—
Butler, Nora; Jessop, Edward S.; and Kolb, John R., 4,348,504, Cl. 525-477.000.

Komatsu, Mikiya; Suzuki, Shunsuke; and Maruyama, Takasumi, to Nissan Motor Co., Ltd. Diecasting apparatus. 4,347,889, Cl. 164-250.100.

Komiya, Hiroyoshi: *See*—
Toyoda, Hiroyasu; Komiya, Hiroyoshi; and Itakura, Hideaki, 4,348,577, Cl. 219-121.0PE.

Komiya, Takao; and Minomiya, Mitsuo, to Canon Kabushiki Kaisha. Photo-sensitive medium for electrophotography. 4,348,469, Cl. 430-55.000.

Kondo, Shigeo; and Yoshiike, Nobuyuki, to Matsushita Electric Industrial Co., Ltd. Electrochromic display device. 4,348,077, Cl. 350-357.000.

Kondo, Toshio: *See*—
Kobayashi, Akio; Kikuchi, Takehiro; Kondo, Toshio; and Tajima, Masahiko, 4,348,727, Cl. 364-431.060.
Sagisaka, Yasuo; Kondo, Toshio; and Tajima, Masahiko, 4,348,728, Cl. 364-431.060.

Kong, Peter T.: *See*—
Elehew, Wolodymyr R.; and Kong, Peter T., 4,348,466, Cl. 429-84.000.

Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Shefford, Roger A., 4,348,436, Cl. 428-35.000.

Koomoto, Akira: *See*—
Yano, Shozo; Miyake, Toshiyuki; Fujinaga, Yasuhiro; Koomoto, Akira; Kawara, Toshio; Yagi, Akio; Tsuji, Tomohiro; and Nagaoka, Tadashi, 4,347,903, Cl. 177-25.000.

Koppers Company, Inc.: *See*—
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Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, to Hitachi, Ltd. Electronic device and method of fabricating the same. 4,348,751, Cl. 368-82.000.

Koser, Gerald F.; and Wettach, Richard H., to University of Akron, The. Composition and a process for the preparation of [hydroxy(organosulfonyloxy)iodo]arenes and their use in a regiospecific synthesis of diaryliodonium salts. 4,348,525, Cl. 546-346.000.

Kost, William E.; and Schoenberger, Norman, Jr., to Weyerhaeuser Company. Tray. 4,347,969, Cl. 229-34.0HW.

Koster, Johannes: *See*—
Blahak, Johannes; Hubner, Hans; Koster, Johannes; Meiners, Hans J.; and Thomas, Heinz, 4,348,536, Cl. 560-169.000.

Kosti, Carl M. Plaque disclosing dentifrice compositions with semi-solid microcapsules of dye. 4,348,378, Cl. 424-7.000.

Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic valve lift device. 4,347,812, Cl. 123-90.550.

Kosuge, Hisao: *See*—
Fujii, Osamu; Kishimoto, Toshio; Kosuge, Hisao; and Nagamine, Ryoji, 4,348,164, Cl. 425-89.000.

Kouda, Akinori: *See*—
Furuya, Takeshi; Uchiyama, Yoshihisa; and Kouda, Akinori, 4,348,341, Cl. 264-8.000.

Kovach, Alan J.: *See*—
Gorgone, Robert L.; Iannadrea, Gerald M.; Dolejs, Anthony H.; Knox, Bruce R.; and Kovach, Alan J., 4,348,656, Cl. 340-146.30R.

Kowalsky, Horst; and Scheer, Horst. Dietetic composition for natural digestion regulation. 4,348,379, Cl. 424-34.000.

Kozaki, Yuji: *See*—
Kimura, Seiichiro; Iwasaki, Yuhei; and Kozaki, Yuji, 4,348,592, Cl. 250-560.000.

Kozima, Akio; Akutsu, Eiichi; and Ichizuka, Kiyomi, to Ricoh Co., Ltd. Electrophotographic element containing disazo compounds. 4,348,470, Cl. 430-72.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, 4,348,339, Cl. 264-0.500.

Krai, Harry J., to Eastman Kodak Company. Manufacture of cellulose ester film. 4,348,238, Cl. 106-177.000.

Kramer, Horst G., to Monsanto Company. Method for producing neutron doped silicon having controlled dopant variation. 4,348,351, Cl. 376-183.000.

Kraus, Peter: *See—*
Kuhle, Engelbert; Kraus, Peter; and Klauke, Erich, 4,348,411, Cl. 424-319.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Vostrovsky, Ernst, 4,348,165, Cl. 425-185.000.

Kreft, Keith A., to Sun Electric Corporation. Method and apparatus for engine exhaust analyzer. 4,348,732, Cl. 364-571.000.

Krehan, Ingomar: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,348,394, Cl. 424-248.570.

Kresse, Horst: *See—*
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,348,324, Cl. 549-369.000.

Kriozere, Richard A., to Professional Tape Company, Inc. Pressure sensitive seal. 4,348,440, Cl. 428-41.000.

Krishnaswamy, Srinivasan, to Shell Oil Company. Single phase flow measurement. 4,347,747, Cl. 73-861.180.

Krude, Werner; and Harz, Peter, to Uni-Cardan Aktiengesellschaft. Universal joint. 4,348,196, Cl. 464-11.000.

Kruschwitz, Werner, to Draftex Development, AG. Window glass mounting arrangements. 4,347,693, Cl. 52-208.000.

Kuchman, Michael J.: *See—*
Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., 4,347,707, Cl. 62-69.000.

Kudo, Eiichi: *See—*
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Kugo, Masaru: *See—*
Igarashi, Osamu; Kugo, Masaru; and Watanabe, Shizuhisa, 4,348,726, Cl. 364-424.000.

Kuhle, Engelbert; Kraus, Peter; and Klauke, Erich, to Bayer Aktiengesellschaft. Combating bacteria with halogenomethylsulphonylphenyl-phthalamic acids. 4,348,411, Cl. 424-319.000.

Kuhle, Engelbert: *See—*
Dickore, Karlfried; and Kuhle, Engelbert, 4,348,331, Cl. 260-465.00D.

Kulik, John J.: *See—*
Harvey, James F.; Chambers, Walter S.; and Kulik, John J., 4,348,186, Cl. 434-44.000.

Kunioka, Saburo; Kawaguchi, Hatsuo; and Ono, Minoru, to Shinhokoku Steel Corporation. Heat-treatment of semifinished product-sliding surface of shaping members in plastic metal-working apparatus. 4,348,241, Cl. 148-6.350.

Kuniya, Jiro: *See—*
Imai, Katsuyuki; Masaoka, Isao; Chiba, Yochiteru; Kanno, Masayoshi; Kuniya, Jiro; and Itow, Hisao, 4,348,041, Cl. 285-286.000.

Kunugi, Yoshiro: *See—*
Tanaka, Kazuyuki; Ueki, Yoshiharu; Kunugi, Yoshiro; and Sakaguchi, Shozaburo, 4,348,616, Cl. 315-314.000.

Kuper, Walter, to Gummi Kuper GmbH & Co. KG. Snow removal bar for the snow removal plate of a snow plow. 4,347,677, Cl. 37-233.000.

Kurshan, Robert P.: *See—*
Hertz, David; Kurshan, Robert P.; and Malah, David, 4,348,735, Cl. 364-724.000.

Kurtz, Stuart J., to Union Carbide Corporation. Method for reducing melt fracture during extrusion of a molten narrow molecular weight distribution, linear, ethylene copolymer. 4,348,349, Cl. 264-564.000.

Kurz, Craven H. Pulsating orthodontic appliance. 4,348,177, Cl. 433-5.000.

Kurz, Craven H. Vibrational orthodontic appliance. 4,348,178, Cl. 433-6.000.

Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, to Ciba-Geigy Corporation. Thioxanthonecarboxylic acids, esters, thioesters and amides with reactive functional groups. 4,348,530, Cl. 549-27.000.

Kwiatkowski, Sigmund: *See—*
Wills, Neville D.; and Kwiatkowski, Sigmund, 4,348,025, Cl. 273-73.00R.

Kwon, Joon T.; and Gelbein, Abraham P., to Lummus Company, The. Olefin oxidation. 4,348,537, Cl. 560-243.000.

Kyo, Suizo: *See—*
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.

Kyomasu, Ryuichi: *See—*
Takasugi, Nobuhiro; and Kyomasu, Ryuichi, 4,347,964, Cl. 228-4.500.

L. R. Nelson Corporation: *See—*
Hayes, Jerry R., 4,347,981, Cl. 239-394.000.

La Telemecanique Electrique: *See—*
Boucher, Guy, 4,348,051, Cl. 297-423.000.
Bouteille, Daniel; Nicolas, Michel; and Prudhomme, Pierre, 4,347,864, Cl. 137-269.000.

Laakso, John K., to Marketing Displays, Inc. Multi-sided display device. 4,347,678, Cl. 40-607.000.

LaBar, Judith LePage, executor: *See—*
Hines, James E., Jr.; and LaBar, Richard G., deceased, 4,348,236, Cl. 106-38.270.

LaBar, Richard G., deceased: *See—*
Hines, James E., Jr.; and LaBar, Richard G., deceased, 4,348,236, Cl. 106-38.270.

Lacour, Alain P.: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,348,393, Cl. 424-248.570.

Lamarche, Paul E., to Borg-Warner Corporation. Two-stage torsional vibration damper. 4,347,717, Cl. 464-64.000.

Lamson & Sessions Co.: *See—*
Capuano, Terry D., 4,347,636, Cl. 10-86.00F.

Land Combustion Limited: *See—*
Swithenbank, Joshua; and Taylor, David S., 4,348,169, Cl. 431-89.000.

Lande, Maurice A.: *See—*
David, Roger J. P.; and Lande, Maurice A., 4,348,634, Cl. 323-353.000.

Landes, Raymond L., to Libbey-Owens-Ford Company. Sheet aligning apparatus. 4,347,927, Cl. 198-434.000.

Lang, Charles F.: *See—*
Brown, Raymond J.; Keller, Ronald L.; and Lang, Charles F., 4,348,366, Cl. 423-111.000.

Langlois, Michel: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,348,393, Cl. 424-248.570.

Lantz, George H. Multiple step vented hull. 4,348,195, Cl. 440-100.000.

Lantzsch, Reinhard: *See—*
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.

Lanzillotti, Harry V.; Burnett, George H.; Wayte, Alline R.; Osdene, Thomas S.; Claflin, Warren E.; Lilly, A. Clifton, Jr.; and Nienow, John F., to Philip Morris Incorporated. Method of making smoking articles. 4,347,855, Cl. 131-78.000.

Laramee, Benjamin E.: *See—*
Consolazio, George A.; Sheppard, James A.; and Laramee, Benjamin E., 4,348,424, Cl. 427-4.000.

Larson, Richard C.: *See—*
Curry, Robert D.; Larson, Richard C.; and Clewett, Merle E., 4,347,922, Cl. 193-23.000.

Larsson, Rolf G.: *See—*
Hedren, A. Thomas; and Larsson, Rolf G., 4,348,575, Cl. 219-86.330.

Lasswell, Tull C.; and Monier, John L., to Tri-X Corporation. Stop-leak composition for automobile cooling systems and the like. 4,348,235, Cl. 106-33.000.

Latimer, John P., to Deepsea Ventures, Inc. Dredging means having means for excluding oversized slender objects. 4,347,675, Cl. 37-57.000.

Laurin, Dean G.: *See—*
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,348,209, Cl. 23-232.00R.

Lautenschlager, Gerhard W.: *See—*
Lautenschlager, Karl; and Lautenschlager, Gerhard W., 4,347,644, Cl. 16-50.000.

Lautenschlager, Karl; and Lautenschlager, Gerhard W., to Karl Lautenschlager KG Mobelbeschlagfabrik. Over-center self closing hinge. 4,347,644, Cl. 16-50.000.

Lautenschlager, Karl, to Karl Lautenschlager, KG Mobelbeschlagfabrik. Joining device. 4,348,130, Cl. 403-231.000.

Lauven, Walter, to Ford Motor Company. Hydraulic control valve system for a planet gear transmission particularly for motor vehicles. 4,347,764, Cl. 74-867.000.

Law, Bliss W.; Kirchoff, George F.; and Adams, Gary V., to Thiokol Corporation. Safety cushion attachable to belt-type restraints. 4,348,037, Cl. 280-733.000.

Lazarus, Stanley D.; and Lofquist, Robert A., to Allied Corporation. Production of thermally stabilized polyester with alkylene carbonates and sodium or potassium thiocyanate. 4,348,314, Cl. 525-439.000.

Le Silicium Semiconducteur SSC: *See—*
Arnould, Jacques, 4,348,545, Cl. 136-244.000.

Lear Siegler, Inc.: *See—*
Litkewycz, Stanley, 4,348,014, Cl. 267-87.000.

Leary, David J. Gas monitoring apparatus. 4,347,732, Cl. 73-23.000.

Lebesnerais, Gerard M., to International Business Machines Corporation. Circuit including at least two MTL semi-conducting devices showing different rise times and logic circuits made-up therefrom. 4,348,595, Cl. 307-221.00R.

Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., to Schering Corporation. Microbiological methylation of aminoglycosyl-aminoglycosides. 4,348,516, Cl. 536-10.000.

Lee, John M.: *See—*
Bauman, William C.; Lee, John M.; and Burba, John L., III, 4,348,296, Cl. 252-184.000.
Bauman, William C.; and Lee, John M., 4,348,297, Cl. 252-184.000.

Lee, Roy C., to Phillips Petroleum Company. Method and apparatus for removing hydrogen sulfide from fuel for an internal combustion engine. 4,347,811, Cl. 123-1.00A.

Leesona Corporation: *See—*
Brouwer, Charles W.; Osbon, H. Gary; and Wueger, Karl W., 4,347,872, Cl. 139-435.000.

Lefevre, Joseph D.: *See—*
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,348,429, Cl. 427-125.000.

Lehmann, Wolfgang: *See—*
Lobach, Wilfried; Kolb, Gunter; Lehmann, Wolfgang; Cramm, Gunther; Muller, Friedhelm; and Muszik, Janos, 4,348,514, Cl. 528-367.000.

Leif, Robert C., to Coulter Electronics, Inc. Orifice inside optical element. 4,348,107, Cl. 356-72.000.

Leland, Kenneth W.; and Sollenberger, Nelson R., to Bell Telephone Laboratories, Incorporated. Frequency stabilization circuit for a local oscillator. 4,348,772, Cl. 455-260.000.

Lenhardt, Theodore, to Raym Company, Inc. Agricultural sprayer. 4,347,978, Cl. 239-78.000.

Leonard, Allan S.; Bolz, Ralph C.; and Burcz, Lawrence D., to Ford Motor Company. Multiple ratio overdrive transmission. 4,347,765, Cl. 74-869.000.

Leonard, Michael R., to W. J. Industries, Incorporated. Tension monitor means and system. 4,347,993, Cl. 242-75.510.

Les Fils d'Auguste Scheuchzer S.A.: *See—*
Scheuchzer, Fredy; and Buhler, Fritz, 4,347,688, Cl. 51-178.000.

Lester, Dozier. Frog feeding apparatus. 4,347,808, Cl. 119-51.00R.

Le Tarte, Walter, to Anthony, Richard A., a part interest. Deburring apparatus. 4,347,639, Cl. 15-21.00D.

Letournoux, Alain; and Raye, Christian, to Societe Industrielle Bertrand Faure. Hinging devices for seat backs. 4,348,050, Cl. 297-365.000.

Lever Brothers Company: *See—*
Clarke, David E.; Davies, James F.; and Tune, John B., 4,348,293, Cl. 252-90.000.

Levine, Peter A.: *See—*
Jastrzebski, Lubomir L.; and Levine, Peter A., 4,348,690, Cl. 358-44.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,348,219, Cl. 71-92.000.

Lewandowski, Raymond F.: *See—*
Golbeck, Bernard J.; Lewandowski, Raymond F.; Rentzsch, Donald A.; and Richardson, Lonnie J., 4,348,569, Cl. 200-155.00R.

Lewis, John C., Jr., to Tucel Industries, Inc. Method for making a tufted brush. 4,348,060, Cl. 300-21.000.

Libbey-Owens-Ford Company: *See—*
Landes, Raymond L., 4,347,927, Cl. 198-434.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Klank, Otto; Rottmann, Dieter; and Wossner, Helmut, 4,348,771, Cl. 455-180.000.

Lieb, Folker: *See—*
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,348,332, Cl. 260-502.40R.

Lightweis, David J.: *See—*
Mc Larney, Joseph C.; and Lightweis, David J., 4,347,650, Cl. 29-25.420.

Likins, Garland E., Jr.: *See—*
Rausche, Frank; and Likins, Garland E., Jr., 4,347,743, Cl. 73-654.000.

Lilly, A. Clifton, Jr.: *See—*
Lanzillotti, Harry V.; Burnett, George H.; Wayte, Alline R.; Osdene, Thomas S.; Claflin, Warren E.; Lilly, A. Clifton, Jr.; and Nienow, John F., 4,347,855, Cl. 131-78.000.

Lin, Chifa F.: *See—*
Lynch, Cheryl J.; Lin, Chifa F.; and Melachouris, Nicholas, 4,348,420, Cl. 426-272.000.

Linden-Alimak AB: *See—*
Backman, Bo G., 4,348,275, Cl. 209-310.000.

Linden, Hans W.: *See—*
Blank, Heinz U.; Behre, Horst; and Linden, Hans W., 4,348,336, Cl. 260-508.000.

Linderberg, Robert L.: *See—*
Benton, Ronald; Kidder, Kenneth B.; Linderberg, Robert L.; Tinsley, Timothy M.; and Westley, Curtis E., 4,347,712, Cl. 62-175.000.

Lindmayer, Joseph, to Solarex Corporation. Method of making solar cell. 4,348,254, Cl. 156-647.000.

Lindsay, John A., to Lynwood Products Limited. Cabinets and doors therefor. 4,348,069, Cl. 312-324.000.

Lindstrom, Lars: *See—*
Marklund, Erland; and Lindstrom, Lars, 4,348,145, Cl. 414-288.000.

Linhart, Karl; Pawellek, Dieter; and Gleinig, Harald, to Bayer Aktiengesellschaft. Process for the partial reduction of polynitrated diaryl compounds. 4,348,335, Cl. 260-508.000.

Lipfert, Donald E. Wind power generator. 4,348,594, Cl. 290-54.000.

Lipsitz, Barry R.; and Forman, Charles D. Electronic game board. 4,348,191, Cl. 434-308.000.

Lipton, Stuart A.; and Manzione, James V., Jr. Measuring beta-hydroxybutyrate concentration in urine. 4,348,205, Cl. 23-230.00B.

Litkewycz, Stanley, to Lear Siegler, Inc. Torsion bar spring auxiliary panel for bedding unit. 4,348,014, Cl. 267-87.000.

Little, Roger G., to Spire Corporation. Front surface metallization and encapsulation of solar cells. 4,348,546, Cl. 136-256.000.

Litton Industrial Products, Inc.: *See—*
Vollrath, Donald E., 4,348,718, Cl. 363-87.000.

Lizen, Christian E., to Cockerill and Centre de Technologies Nouvelles. Explosive plug for blocking tubes. 4,347,790, Cl. 102-304.000.

Lloyd-Jones, Robert, to Salkhad Pty. Limited. Soffit and fascia panel. 4,347,691, Cl. 52-95.000.

Lobach, Wilfried; Kolb, Gunter; Lehmann, Wolfgang; Cramm, Gunther; Muller, Friedhelm; and Muszik, Janos, to Bayer Aktiengesellschaft. Polyamines containing urea groups. 4,348,514, Cl. 528-367.000.

LoCascio, James J., to Motorola, Inc. Noise blanker circuit for use with electronic ignition systems or the like. 4,347,827, Cl. 123-618.000.

Lockhart, Jess W.: *See—*
Jakubowski, Thaddeus, Jr.; Lockhart, Jess W.; and Robinson, Norman F., 4,347,777, Cl. 89-1.50G.

Lockheed Corporation: *See—*
Rice, Steven J.; and Sherman, Donald E., 4,348,760, Cl. 371-20.000.

Lockwood Graders (UK) Limited: *See—*
Cowlin, Robert M.; and Helsby, Nigel C., 4,348,277, Cl. 209-705.000.

Lockwood, Harry F.: *See—*
Zory, Peter S.; Scholl, Frederick W.; and Lockwood, Harry F., 4,347,655, Cl. 29-589.000.

Loctite Corporation: *See—*
Argazzi, Dennis J.; and Burger, Robert, 4,347,806, Cl. 118-710.000.

Loffelman, Frank F., to American Cyanamid Company. Novel light stabilizers for polymers. 4,348,493, Cl. 524-100.000.

Lofquist, Robert A.: *See—*
Lazarus, Stanley D.; and Lofquist, Robert A., 4,348,314, Cl. 525-439.000.

LogEtronics, Inc.: *See—*
Sippel, Charles, 4,348,097, Cl. 354-293.000.

Lohmann, Joachim W.: *See—*
Scheerer, Rainer; Ranz, Erwin; and Lohmann, Joachim W., 4,348,474, Cl. 430-382.000.

Lohr, Albrecht: *See—*
Hennemann, Manfred; and Lohr, Albrecht, 4,348,305, Cl. 252-542.000.

Lohr, Joseph E., Jr., to Stepan Chemical Company. Evaluating sprayability. 4,347,742, Cl. 73-432.0SD.

Lohrmann, Dieter R., to United States of America, Army. Microwave power pulse generator. 4,348,649, Cl. 331-96.000.

London, Solomon, to General Electric Company. Two-speed single phase motor with centrifugal switch. 4,348,626, Cl. 318-772.000.

Long, Robert L., to American Monitor Corporation. Uric acid assay and reagent system therefor. 4,348,208, Cl. 23-230.00B.

Lord Corporation: *See—*
Blenner, Donald R.; Auerbach, Robert A.; and Boenig, Herman V., 4,348,426, Cl. 427-41.000.

L'Oreal: *See—*
Bouillon, Claude; and Maignan, Jean, 4,348,383, Cl. 424-70.000.
Grollier, Jean-Francois; and Fourcadier, Chantal, 4,348,202, Cl. 8-406.000.
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, 4,348,380, Cl. 424-47.000.

Loree, Thomas J., to Boeing Company, The. Multiple wire bundle support assembly. 4,347,998, Cl. 248-68.00R.

Loucks, Carl C. Electric motor alternating power supply for vehicles. 4,348,628, Cl. 320-61.000.

Loudermilk, Jake, Jr. Multicompartment folding carton. 4,347,967, Cl. 229-27.000.

Louis, Gain L.: *See—*
Brown, Roger S.; Salaun, Harold L., Jr.; and Louis, Gain L., 4,347,647, Cl. 19-128.000.

Loyd, Morris S.; and McGann, Timothy W., to Rockwell International Corporation. Method of fabricating a reinforced tubular structure. 4,348,247, Cl. 156-156.000.

Lucchesi, Armand P., to J. C. Penney Company, Inc. Self-balancing alarm system. 4,348,661, Cl. 340-510.000.

Ludwig, Heinz: *See—*
Marquardt, Kurt; and Ludwig, Heinz, 4,347,704, Cl. 60-648.000.

Luebke, Clement J.; and Daniels, Lowell W., to Alco Standard Corporation. Pressure cooking device with exhaust and drain valves. 4,347,833, Cl. 126-369.000.

Luhleich, Hartmut: *See—*
Dias, Francisco J.; Hannen, Willi; Luhleich, Hartmut; and Pflaum, Peter, 4,347,671, Cl. 34-15.000.

Luhring, Claus: *See—*
Fries, Ortwin; and Luhring, Claus, 4,348,282, Cl. 210-242.300.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul; and Geschka, Hugo-Werner, 4,347,813, Cl. 123-179.00J.

Lukasavage, William. Rankine cycle system employing seasonal temperature variations. 4,347,703, Cl. 60-641.600.

Lummus Company, The: *See—*
Kwon, Joon T.; and Gelbein, Abraham P., 4,348,537, Cl. 560-243.000.

Lustig, Stanley; and Vicik, Stephen J., to Union Carbide Corporation. Puncture-resistant heat shrinkable multilayer packaging film. 4,348,437, Cl. 428-35.000.

Luzina, Max: *See—*
Dombrowski, Theodor; and Luzina, Max, 4,347,769, Cl. 82-8.000.

Lynch, Cheryl J.; Lin, Chifa F.; and Melachouris, Nicholas, to Nutrisearch Company. Process for binding comminuted meat. 4,348,420, Cl. 426-272.000.

Lynch, Peter. Map. 4,348,038, Cl. 283-34.000.

Lynwood Products Limited: *See—*
Lindsay, John A., 4,348,069, Cl. 312-324.000.

Lyons, Michael D.: *See—*
Strobel, Richard A.; and Lyons, Michael D., 4,347,869, Cl. 137-488.000.

MacFee, Norman W. Method and apparatus for ultrasonic bonding of coupling elements to a tape. 4,348,245, Cl. 156-73.100.
Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, to Rhone-Poulenc Industries. Coupling agent compositions for coupling an elastomer to a filler and elastomer/filler compositions containing same. 4,348,311, Cl. 524-530.000.
MacInnis, Martin B.: *See*—
Ritsko, Joseph E.; MacInnis, Martin B.; and Henson, Thomas L., 4,348,231, Cl. 75-203.000.
Madden, Ian L.: *See*—
Duncan, Budd L.; and Madden, Ian L., 4,348,372, Cl. 423-497.000.
Madsen, Per J.: *See*—
Tankred, Hans J.; Madsen, Per J.; and Stannow, Jorgen C., 4,348,607, Cl. 310-217.000.
Maeda, Katsumi, to Star Seimitsu Kabushiki Kaisha. One revolution clutch assembly using gears. 4,347,919, Cl. 192-33.00R.
Maeda, Tadayuki: *See*—
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,348,363, Cl. 422-192.000.
Maeda, Takuya; Yamada, Tsutomu; and Kishimoto, Mitsuharu, to Kawasaki Jukogyo Kabushiki Kaisha. Batch process and static-bed type apparatus for reducing iron ore. 4,348,225, Cl. 75-34.000.
Magnetrol International, Incorporated: *See*—
Townsend, Lawrence B., 4,347,740, Cl. 73-304.00C.
Magnusson, Alan B.: *See*—
Herweh, John E.; Garrett, Thomas B.; and Magnusson, Alan B., 4,348,508, Cl. 526-268.000.
Mahnken, Walter J., to Honeywell Inc. Bi-directional tape reel brake. 4,347,995, Cl. 242-204.000.
Maignan, Jean: *See*—
Bouillon, Claude; and Maignan, Jean, 4,348,383, Cl. 424-70.000.
Mains, Gilbert J.: *See*—
Rockley, Mark G.; and Mains, Gilbert J., 4,348,428, Cl. 427-54.100.
Makinen, Pekka. Set of shelves. 4,347,795, Cl. 108-152.000.
Malah, David: *See*—
Hertz, David; Kurshan, Robert P.; and Malah, David, 4,348,735, Cl. 364-724.000.
Maldavs, Ojars, to Gould Inc. Lever-type quick disconnect coupling. 4,347,870, Cl. 137-614.050.
Maly, Heinrich; and Werner, Franz, to U.S. Philips Corporation. Anti erase interlock for a magnetic tape cassette. 4,348,707, Cl. 360-132.000.
Malzacher, Fred. Gripper system for moving drilling rigs. 4,348,007, Cl. 254-106.000.
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Alekhin, Stanislav A.; and Bakhir, Tatyana M. Continuous borehole-logging method. 4,347,736, Cl. 73-155.000.
Mancini, Derek V., to Consumers Glass Company Limited. Combination autoclave pump and nozzle. 4,348,162, Cl. 417-431.000.
Mandros, James A. Vehicle guideway system. 4,347,791, Cl. 104-156.000.
Manzione, James V., Jr.: *See*—
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Marconi Company Limited, The: *See*—
Auterson, James, 4,348,109, Cl. 356-252.000.
Marcum, Norman E.: *See*—
Anderson, Harold M.; Marcum, Norman E.; and DuVall, Wilbur E., 4,348,624, Cl. 318-634.000.
Marketing Displays, Inc.: *See*—
Laakso, John K., 4,347,678, Cl. 40-607.000.
Markham, Roger G., to Xerox Corporation. Linear ink jet deflection method and apparatus. 4,348,682, Cl. 346-1.100.
Marklund, Erland; and Lindstrom, Lars, to Renholmens Mekaniska Verkstad AB. Wood compartment. 4,348,145, Cl. 414-288.000.
Marko, Ollie W.: *See*—
Alanko, Allan M.; Marko, Ollie W.; Skinner, Charles E.; and Wood, Larry H., 4,348,532, Cl. 556-457.000.
Marley/Wylain Company: *See*—
Perry, Stephen J.; Ehret, Gordon F.; and Rowley, William N., 4,348,281, Cl. 210-129.000.
Marmon Company: *See*—
Sharp, Paul H., 4,348,625, Cl. 318-757.000.
Marquardt, Kurt; and Ludwig, Heinz, to Hager and Elsasser GmbH. Thermal power plant water treatment process. 4,347,704, Cl. 60-648.000.
Marquez, Joseph A.: *See*—
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,348,516, Cl. 536-10.000.
Marshall, F. Paul: *See*—
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Marshall, Harry A.: *See*—
Calvin, William J.; Goldstein, Stuart S.; and Marshall, Harry A., 4,348,486, Cl. 518-704.000.
Goldstein, Stuart S.; Calvin, William J.; and Marshall, Harry A., 4,348,487, Cl. 518-704.000.
Martin, David M. G.: *See*—
Edwards, Philip N.; and Martin, David M. G., 4,348,322, Cl. 549-296.000.
Martin, David O.; and Martin, Lawrence G., to Martin Overhead Door and Electronics Company. Method of preparing a section for an overhead door. 4,347,653, Cl. 29-526.00R.
Martin, Lawrence G.: *See*—
Martin, David O.; and Martin, Lawrence G., 4,347,653, Cl. 29-526.00R.
Martin, Michael D., to Bendix Corporation, The. Telescoping steering shaft. 4,347,757, Cl. 74-493.000.
Martin Overhead Door and Electronics Company: *See*—
Martin, David O.; and Martin, Lawrence G., 4,347,653, Cl. 29-526.00R.
Martin, Walter L., Jr.: *See*—
Williamson, Kenneth T., Jr.; Bruce, Samuel S., Jr.; and Martin, Walter L., Jr., 4,348,217, Cl. 65-2.000.
Martinez, Jose L. P.; and Osorio, Jose P. Injection-type pressure-freed carburetor. 4,348,338, Cl. 261-142.000.
Maruyama, Takasumi: *See*—
Komatsu, Mikiya; Suzuki, Shunsuke; and Maruyama, Takasumi, 4,347,889, Cl. 164-250.100.
Marvin Glass & Associates: *See*—
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Masaki, Ichiro, to Unimation, Inc. Workpiece monitoring means for electric discharge working apparatus. 4,348,578, Cl. 219-130.010.
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Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See*—
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Mascitti, Albert A.: *See*—
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,348,413, Cl. 424-322.000.
Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,348,257, Cl. 162-162.000.
Mason, Eric K. L.: *See*—
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Massey-Ferguson, Inc.: *See*—
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Masson Scott Thrissell Engineering: *See*—
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Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, 4,348,478, Cl. 435-172.000.
Matania, Eliyahu: *See*—
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Mathews, Lester R. Swimming pool cleaner. 4,347,979, Cl. 239-206.000.
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Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, 4,348,339, Cl. 264-0.500.
Matsubara, Noboru: *See*—
Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, 4,347,812, Cl. 123-90.550.
Matsuda, Akira; Hayakawa, Yoshihiro; Yasuda, Shigeo; and Iwasaki, Motoaki, to Bridgestone Tire Company Limited. Tire internal pressure monitoring and display apparatus for tired vehicles. 4,348,654, Cl. 340-58.000.
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Shimanuki, Shizuka; Matsumoto, Toshimi; Sato, Hiroshi; Onuma, Tsutomu; and Kirihara, Seishin, 4,348,131, Cl. 403-272.000.
Matsumoto, Yasuo: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Matsuyama, Masahiro: *See*—
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Mattel, Inc.: *See*—
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Matth. Hohner AG: *See*—
Held, Hans-Dieter; and Schaller, Waldemar, 4,347,775, Cl. 84-380.00C.
Maucher, Paul; and Geschka, Hugo-Werner, to Luk Lamellen und Kupplungsbau GmbH. Apparatus for starting an internal combustion engine. 4,347,813, Cl. 123-179.00J.
Mauk, Ernest R.; and Van Norman, William A. Electronic load protection circuit. 4,348,709, Cl. 361-92.000.
Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; Gallenkamp, Bernd; and Klauke, Erich, to Bayer Aktiengesellschaft. Preparation of 3-bromo-4-fluoro-benzaldehyde acetals and intermediates therefor. 4,348,538, Cl. 562-459.000.
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Hammes, Theo, 4,347,947, Cl. 220-378.000.
Maxim, John. Conductive fluid activated devices. 4,347,683, Cl. 46-251.000.
Maximoff, Paul: *See*—
Gudaitis, Bernard V.; and Maximoff, Paul, 4,348,072, Cl. 339-97.00R.

May, David C.; and Jarboe, Charles H., to Research Corporation. Probenecid-dyphylline therapy. 4,348,397, Cl. 424-253.000.
Mayfield, Jack K. Hook inserter device. 4,347,845, Cl. 128-303.00R.
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Mazzoni, Renato J.: *See*—
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McAlister, Doyle V.; Gunter, Thomas G.; Spak, Michael E.; and Schriber, Gene A., to Motorola, Inc. Priority encoder. 4,348,741, Cl. 364-900.000.
McBee, William C.; and Sullivan, Thomas A., to United States of America, Commerce. Concrete formulation comprising polymeric reaction product of sulfur/cyclopentadiene oligomer/dicyclopentadiene. 4,348,313, Cl. 524-788.000.
McCartney, Robert F.; and Nazarenko, Nicholas, to Du Pont de Nemours, E. I., and Company. Stabilization of sodium dispersion. 4,348,300, Cl. 252-309.000.
McCauley, Kerry. Foot massager. 4,347,838, Cl. 128-33.000.
McConnaughey, Paul W.: *See*—
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McDaniel, Joe D., Jr.; and Pruitt, Paul L., to Zoecon Corporation. Recrystallization of phosmet. 4,348,321, Cl. 260-326.00E.
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Jakubowski, Thaddeus, Jr.; Lockhart, Jess W.; and Robinson, Norman F., 4,347,777, Cl. 89-1.50G.
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McEwen, David M. Navigational calculating device. 4,347,669, Cl. 33-431.000.
McGann, Timothy W.: *See*—
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McGinn, Michael, to Motorola, Inc. Horizontal phase detector gain control. 4,348,694, Cl. 358-158.000.
McGinty, Joseph R.: *See*—
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McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., to Dow Chemical Company, The. Process for silver coating of permeable substrates. 4,348,429, Cl. 427-125.000.
McIntyre, James D. E., to Bell Telephone Laboratories, Incorporated. Enhancement of optical absorption and contrast of electrochromic devices. 4,348,078, Cl. 350-357.000.
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McKee, Elmer S.; and McConnaughey, Paul W., to Mine Safety Appliances Company. Colorimetric dosimeter. 4,348,358, Cl. 422-56.000.
McKelvy, Marvin D., to A. B. Chance Company. Mechanical device for picking up an electrical load. 4,348,561, Cl. 200-51.00R.
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Mc Larney, Joseph C.; and Lightweis, David J., to AVX Corporation. Method of making marginless multi-layer ceramic capacitors. 4,347,650, Cl. 29-25.420.
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Price, Donald R., 4,347,884, Cl. 152-158.000.
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McVeigh, Peter J.; and Rudish, Ronald M., to Eaton Corporation. Series fed phased array antenna exhibiting constant input impedance during electronic scanning. 4,348,681, Cl. 343-854.000.
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Medford, Richard D.; Henry, Pearison W.; and Cooper, Jerry W., to Dayco Corporation. Protective cover and method of making same. 4,347,685, Cl. 47-28.00R.
Medi-Timer Corporation: *See*—
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Meier, Dale J.; and Jarecki, Leszek, to Michigan Molecular Institute. Ultra-drawing crystalline polymers under high pressure. 4,348,350, Cl. 264-570.000.
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Meisner, David B.; and Vacval, Dusan M., to International Harvester Co. Single cable actuated tailgate. 4,348,055, Cl. 298-23.0DF.
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Meric, Jean-Paul: *See*—
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Merkel, Willi, to Fritz Fuss Kom. Ges. Elektrotechnische Fabrik. Method for transmitting binary signals over a foreign wiring network. 4,348,657, Cl. 340-310.00R.
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Bezencon, Jean-Jacques, deceased; Menzi, Georges; and Mermoud, Lucien, 4,347,918, Cl. 192-0.02R.
Merrill, John T., to United States of America, Energy. Method and apparatus for electrostatically sorting biological cells. 4,347,935, Cl. 209-3.200.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
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Michael, Richard N., to General Electric Co. Brush wear indicator. 4,348,608, Cl. 310-242.000.
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Michigan Molecular Institute: *See*—
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Miller, Harry C. Portable propane gas hand torch. 4,348,172, Cl. 431-255.000.
Miller, Jack E., to Big Inch Marine Systems, Inc. Release coupling. 4,348,039, Cl. 285-1.000.
Miller, Jesse D., Jr.; and Petzold, James R., to Armstrong World Industries, Inc. Non-skid plastic flooring product and method of manufacture. 4,348,447, Cl. 428-149.000.
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Millspaugh, Russell E., to Continental Group, Inc., The. Magnetic conveyor. 4,347,928, Cl. 198-690.000.
Milly, Lucien. Process and device for suspension of vehicle wheels. 4,348,016, Cl. 267-177.000.
Mimata, Tsutomu: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,348,751, Cl. 368-82.000.
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Gerster, John F., 4,348,521, Cl. 544-353.000.
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Tung, Chi F., 4,348,312, Cl. 428-144.000.
Mino, Masao; and Ohno, Takeshi, to Kabushiki Kaisha Mino Seisakusho. Grooved traverse drum for use in drum winder. 4,347,991, Cl. 242-43.200.
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Ahrens, Paul W., 4,348,188, Cl. 434-72.000.
Mirante, Arthur J. Closed fluid flow system for producing power. 4,347,705, Cl. 60-651.000.

Mischutin, Vladimir, to White Chemical Corporation. Flame retardants. 4,348,306, Cl. 252-608.000.

Mistrick, George R.; Bowser, George H.; and Mazzoni, Renato J., to PPG Industries, Inc. Primed multiple glazed units for curtainwall systems. 4,348,435, Cl. 428-34.000.

Mistry, Kantilal, to Blonder-Tongue Laboratories, Inc. Master antenna subscription television system and the like. 4,348,691, Cl. 358-114.000.

Mitani, Kiyoshi. Hand riveter. 4,347,729, Cl. 72-391.000.

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Oishi, Norio; Shimazu, Toshinari; Suganami, Takuya; and Masuda, Takahiro, 4,348,029, Cl. 277-26.000.

Mitsuishi, Yukio; Shiozaki, Shigeru; Chujo, Takao; and Yokoyama, Takeyuki, to Teijin Limited. Polyester film having improved slipperiness. 4,348,446, Cl. 428-148.000.

Mittal, Faquir C.; Arrison, Frank J.; and Schonfeld, Arnold, to Sperry Corporation. Random access flexible disk memory. 4,348,705, Cl. 360-98.000.

Miyake, Toshiyuki: *See—*
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Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; and Yokokawa, Sumio, to Victor Company of Japan, Ltd. Image pickup device. 4,348,617, Cl. 315-370.000.

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Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; and Yokokawa, Sumio, 4,348,617, Cl. 315-370.000.

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Snavely, Earl S., Jr.; and Caldwell, Paul L., Jr., 4,348,289, Cl. 210-749.000.
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Mogami, Satoshi, to Nippon Kogaku K.K. Inverted telephoto type wide angle lens. 4,348,085, Cl. 350-458.000.

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Moldrup, Niels. Cover for a cylinder-shaped pressure container. 4,347,944, Cl. 220-320.000.

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Mondet, Jean: *See—*
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Montes, David M., to Xerox Corporation. Sheet feeding apparatus. 4,348,021, Cl. 271-112.000.

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Moore, Francis C.: *See—*
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Moore, Randy W., to Singer Company, The. Landing light pattern generator for digital image systems. 4,348,184, Cl. 434-42.000.

Moore, Robert J., to Emerson Electric Co. Apparatus for cutting vegetation. 4,347,666, Cl. 30-276.000.

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Moreaud, Henri; and Meric, Jean-Paul, to Omnium d'Assainissement; and Societe des Applications Biologiques du Laser a l'Environnement (SABLE) S.a.r.l. Method of and apparatus for measuring the volume of material in suspension in a liquid. 4,348,112, Cl. 356-338.000.

Morgan, Charles R., to W. R. Grace & Co. Heat activated thiuram containing curable compositions. 4,348,515, Cl. 526-204.000.

Morgan, George W., to Sun Oil Company, Ltd. Multiple-tine ice disaggregation system. 4,348,059, Cl. 299-25.000.

Morgan, John H., to Richards Structural Steel Co., Ltd. Handling and/or treatment of particulate materials. 4,347,876, Cl. 141-70.000.

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Morrison, Howard J.; and Montague, Douglas P., to Marvin Glass & Associates. Device for chilling condiments and the like. 4,347,713, Cl. 62-371.000.

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Mosey, Charles J.: *See—*
Mosey, Charles G.; Mosey, George N.; Mosey, Charles J.; and Mosey, Stephen A., 4,347,770, Cl. 82-90.000.

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Muller, John E., to Jolenn Energy Products Ltd. Idle circuit shut-off valve. 4,347,817, Cl. 123-325.000.
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Kinast, Gunther; Muller, Lutz; Sitt, Rudiger; and Puls, Walter, 4,348,402, Cl. 424-267.000.
Muller, Marcel: *See*—
Nickolson, Robert; Kerb, Ulrich; Wiechert, Rudolf; Alig, Leo; Furst, Andor; and Muller, Marcel, 4,348,327, Cl. 260-397.100.
Muller, Rene, to BBC Brown, Boveri & Company. Electrode for electrolysis of water. 4,348,268, Cl. 204-290.00R.
Multi-Metal Wire Cloth Inc.: *See*—
Peer, George J.; and Bradley, Robert C., 4,348,284, Cl. 210-486.000.
Munkittrick, Kenneth R.: *See*—
Eddens, Fletcher C.; Moore, Robert S.; and Munkittrick, Kenneth R., 4,347,701, Cl. 60-413.000.
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, to Nippon Chemiphar Co., Ltd.; and Teikoku Chemical Industry Co., Ltd. Cyclohexane carboxylic acid derivatives. 4,348,410, Cl. 424-309.000.
Murao, Eiji: *See*—
Senzaki, Takaya; and Murao, Eiji, 4,348,675, Cl. 343-7.0VM.
Murata Kikai Kabushiki Kaisha: *See*—
Ohashi, Kenji, 4,347,990, Cl. 242-36.000.
Murata Manufacturing Co., Ltd.: *See*—
Inoue, Jiro, 4,348,609, Cl. 310-367.000.
Murray, Jerome L. Reversible fluid unit. 4,347,778, Cl. 91-180.000.
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., to Baxter Travenol Laboratories, Inc. Determining quantitative degree of ethylene oxide exposure in sterilization processes. 4,348,209, Cl. 23-232.00R.
Musso, Sandro: *See*—
Pairaud, David J.; Musso, Sandro; Bouvron nee Ferrenbach, Catherine; and Pages-Xatart Pares, Xavier J. M., 4,348,423, Cl. 426-607.000.
Muszik, Janos: *See*—
Lobach, Wilfried; Kolb, Gunter; Lehmann, Wolfgang; Cramm, Gunther; Muller, Friedhelm; and Muszik, Janos, 4,348,514, Cl. 528-367.000.
Muth, Klaus; and Federspieler, Philipp, to Siemens Aktiengesellschaft. Apparatus and method for classifying moving targets. 4,348,674, Cl. 343-5.0SA.
Myers, Charles L.: *See*—
Barnes, Robert R.; and Myers, Charles L., 4,348,652, Cl. 340-52.00R.
Myers, Delbert L. Controlled air intake apparatus for furnaces and the like. 4,347,832, Cl. 126-112.000.
Myers, Ted L.: *See*—
Brown, Birchel S.; Myers, Ted L.; and Easter, Holton C., 4,347,724, Cl. 72-203.000.
Nafissi-Varchei, M. Mehdi, to Schering Corporation. Novel guanidine derivatives. 4,348,406, Cl. 424-300.000.
Nagahori, Katsuhiro, to SI Handling Systems, Inc. Driveless vehicle with speed control cam. 4,347,792, Cl. 104-166.000.
Nagamine, Ryoji: *See*—
Fujii, Osamu; Kishimoto, Toshio; Kosuge, Hisao; and Nagamine, Ryoji, 4,348,164, Cl. 425-89.000.
Nagaoka, Tadashi: *See*—
Yano, Shozo; Miyake, Toshiyuki; Fujinaga, Yasuhiro; Koomoto, Akira; Kawara, Toshio; Yagi, Akio; Tsuji, Tomohiro; and Nagaoka, Tadashi, 4,347,903, Cl. 177-25.000.
Nakagaki, Shintaro: *See*—
Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; and Yokokawa, Sumio, 4,348,617, Cl. 315-370.000.
Nakagawa, Yasuhiko: *See*—
Suzuki, Suzuo; Nakagawa, Yasuhiko; Aihara, Hisamoto; and Matsumoto, Yasuo, 4,347,825, Cl. 123-537.000.
Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,348,308, Cl. 524-110.000.
Nakajima, Isao: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, 4,348,410, Cl. 424-309.000.
Nakajima, Toshio: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, 4,348,410, Cl. 424-309.000.
Nakamura, Keiji: *See*—
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,348,232, Cl. 75-238.000.
Nakamura, Kiyoshi; and Isaka, Masayoshi, to Hitachi, Ltd. Feeding system for linear motor type transporting system. 4,348,618, Cl. 318-38.000.
Nakamura, Kouichi: *See*—
Kamio, Hiroyoshi; Ogino, Yukio; and Nakamura, Kouichi, 4,348,498, Cl. 525-13.000.
Nakamura, Nobuyuki: *See*—
Hamada, Minoru; Nakamura, Nobuyuki; and Odajima, Akira, 4,347,948, Cl. 220-404.000.
Nakanishi, Motoyasu, to Suzuki Sogyo Kabushiki Kaisha; and Kabushiki Kaisha Cubic Engineering. Method of printing. 4,348,246, Cl. 156-73.100.
Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, to Noda Institute for Scientific Research. Method for preparing a recombinant DNA phage. 4,348,477, Cl. 435-172.000.
Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, to Noda Institute for Scientific Research. Method for preparation of a recombinant DNA phage. 4,348,478, Cl. 435-172.000.
Nakatani, Hiroshi; Ishida, Masahide; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Service bargain announcement in an electronic cash register. 4,348,551, Cl. 179-1.0SM.
Namba, Yoshiharu, to Rank Xerox Limited. Fixing roll in a copying machine. 4,348,579, Cl. 219-216.000.
Nardella, Alessandro, to Pedrazzini, Francesco. Adjustable orthodontic screw assembly. 4,348,179, Cl. 433-7.000.
Nardone, Robert M., to Colgate-Palmolive Company. Container closure. 4,347,970, Cl. 229-39.00R.
Naslund, Gustav, to Groko Maskin AB. Method and device for bending sheet-metal sections. 4,347,726, Cl. 72-385.000.
National Plastics Limited: *See*—
Hackwell, Roger E.; Gale, Philip D.; and Mason, Eric K. L., 4,347,943, Cl. 220-306.000.
National Research Development Corporation: *See*—
El-Menshawy, Mohamed F.; Woodrow, Peter A.; and Bhattacharyya, Sushantha K., 4,348,573, Cl. 219-69.00M.
National Semiconductor Corporation: *See*—
Allen, Bert L.; Wourms, Robert L.; and Hu, Daniel C., 4,347,654, Cl. 29-576.00B.
Sauer, Don R., 4,348,602, Cl. 307-530.000.
National Steel Corporation: *See*—
Ernest, Robert T., 4,347,805, Cl. 118-63.000.
Nazarenko, Nicholas: *See*—
McCartney, Robert F.; and Nazarenko, Nicholas, 4,348,300, Cl. 252-309.000.
NCR Corporation: *See*—
Chambers, William I., 4,348,063, Cl. 308-3.800.
Neale, Denis M.; Bontoft, Frederick J.; and Ikin, John B., to Ciba-Geigy AG. Method of inspecting coated web material to detect the presence of downlines thereon. 4,348,114, Cl. 356-431.000.
Nelson, Alexander. Rotary-reactive internal combustion engine 2-360. 4,347,698, Cl. 60-39.340.
Nelson, Bruce J.: *See*—
Gurr, George P.; and Nelson, Bruce J., 4,348,668, Cl. 340-825.060.
Nelson, Donald L., to Dow Chemical Company, The. Heat resistant low shrink polyester resins. 4,348,499, Cl. 525-49.000.
Nelson, Edward I.: *See*—
Balta, Justin O.; and Nelson, Edward I., 4,348,122, Cl. 400-276.000.
Nelson, Keith D.: *See*—
Worth, Sidney V.; and Nelson, Keith D., 4,348,073, Cl. 339-186.00M.
Nelson, Victor R. Method and apparatus for loading a multi-platen press. 4,348,144, Cl. 414-277.000.
NesTier Corporation: *See*—
Baldwin, Mark H., 4,348,001, Cl. 248-243.000.
Neumann, Rainer: *See*—
Serini, Volker; Neumann, Rainer; Friedhofen, Gerhard; Freitag, Dieter; Heuser, Jurgen; and Schwarz, Hans-Helmut, 4,348,542, Cl. 568-727.000.
Newcomb, George R., to General Electric Company. Capacitor with embossed electrodes. 4,348,712, Cl. 361-315.000.
Newcomb, William E., to Norton Company. Ear muff accessory for safety hard hat. 4,347,631, Cl. 2-423.000.
Newton, Barrie H.; Booth, Peter L.; and Davies, Robert, to U.S. Philips Corporation. Time-delay-triggered TRAPATT oscillator with directional filter. 4,348,646, Cl. 331-77.000.
NHK Spring Co., Ltd.: *See*—
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.
Nichols, Robert L. Suction system with cover-port cap attachment breakaway tab. 4,347,946, Cl. 220-375.000.
Nickolson, Robert; Kerb, Ulrich; Wiechert, Rudolf; Alig, Leo; Furst, Andor; and Muller, Marcel, to Schering Aktiengesellschaft. Process for the preparation of 17α-hydroxy- and 17αα-hydroxy-D-homoeticocarboxylic acids. 4,348,327, Cl. 260-397.100.
Nicolas, Michel: *See*—
Bouteille, Daniel; Nicolas, Michel; and Prudhomme, Pierre, 4,347,864, Cl. 137-269.000.
Nielsen, Richard H., to Phillips Petroleum Company. Treating cracking catalyst fines containing a passivating material. 4,348,273, Cl. 208-113.000.
Nienow, John F.: *See*—
Lanzillotti, Harry V.; Burnett, George H.; Wayte, Alline R.; Osdene, Thomas S.; Claflin, Warren E.; Lilly, A. Clifton, Jr.; and Nienow, John F., 4,347,855, Cl. 131-78.000.

Nighan, William L.; and Brown, Robert T., to United Technologies Corporation. Stability enhanced rare-gas monofluoride lasers. 4,348,647, Cl. 372-74.000.
Nigro, Louis V., to Gillette Company, The. Brush assembly. 4,348,126, Cl. 401-135.000.
Nippon Chemiphar Co., Ltd.: *See—*
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, 4,348,410, Cl. 424-309.000.
Nippon Coinco Co. Ltd.: *See—*
Hayashi, Yukichi; Tamara, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,347,924, Cl. 194-1.00N.
Nippon Electric Co., Ltd.: *See—*
Kitamura, Yoshishige, 4,348,601, Cl. 307-530.000.
Okabayashi, Hidekazu; Higuchi, Kohei; and Nozaki, Tadatoshi, 4,348,746, Cl. 365-182.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kamiya, Shingo, 4,348,644, Cl. 330-297.000.
Nishimoto, Tetsuo, 4,347,772, Cl. 84-1.030.
Ogita, Minoru, 4,348,666, Cl. 340-753.000.
Nippon Kogaku K.K.: *See—*
Iizuka, Yutaka, 4,348,090, Cl. 354-224.000.
Iizuka, Yutaka, 4,348,091, Cl. 354-225.000.
Mogami, Satoshi, 4,348,085, Cl. 350-458.000.
Nippon Mining Company, Limited: *See—*
Kamio, Hiroyoshi; Ogino, Yukio; and Nakamura, Kouichi, 4,348,498, Cl. 525-13.000.
Nippon Paint Co., Ltd.: *See—*
Hamada, Minoru; Nakamura, Nobuyuki; and Odajima, Akira, 4,347,948, Cl. 220-404.000.
Nippon Piston Ring Co., Ltd.: *See—*
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,348,232, Cl. 75-238.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Kimura, Seiichiro; Iwasaki, Yuhei; and Kozaki, Yuji, 4,348,592, Cl. 250-560.000.
Nippon Soken, Inc.: *See—*
Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, 4,347,812, Cl. 123-90.550.
Nomura, Ken; Igashira, Toshihiko; and Abe, Seikou, 4,347,826, Cl. 123-549.000.
Nippon Steel Corporation: *See—*
Suemura, Kenichiro; and Osawa, Masami, 4,348,229, Cl. 75-124.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Ohara, Wataru, 4,348,120, Cl. 400-124.000.
Nippon Zeon Co., Ltd.: *See—*
Hokari, Hiroshi; and Nishitai, Iwaki, 4,348,260, Cl. 203-9.000.
Nippondenso Co., Ltd.: *See—*
Kobayashi, Akio; Kikuchi, Takehiro; Kondo, Toshio; and Tajima, Masahiko, 4,348,727, Cl. 364-431.060.
Sagisaka, Yasuo; Kondo, Toshio; and Tajima, Masahiko, 4,348,728, Cl. 364-431.060.
Tsuzuki, Yoshihiko; Okazaki, Hiroshi; Shirasaki, Shinji; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,348,653, Cl. 340-52.00F.
Nishimoto, Tetsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments capable of varying tone pitch during one key depression. 4,347,772, Cl. 84-1.030.
Nishioka, Tatsujiro: *See—*
Hayashi, Yukichi; Tamara, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,347,924, Cl. 194-1.00N.
Nishitai, Iwaki: *See—*
Hokari, Hiroshi; and Nishitai, Iwaki, 4,348,260, Cl. 203-9.000.
Niskin, Shale J.; and Williams, Gerald J. Electric water sampling device. 4,347,751, Cl. 73-864.330.
Nissan Motor Co., Ltd.: *See—*
Komatsu, Mikiya; Suzuki, Shunsuke; and Maruyama, Takasumi, 4,347,889, Cl. 164-250.100.
Saito, Masaaki; Kawamura, Yoshihisa; Sugo, Yuko; and Inoue, Mitsumasa, 4,347,816, Cl. 123-308.000.
Saito, Masaaki, 4,347,821, Cl. 123-440.000.
Sato, Toshio; and Ogawa, Yasuyuki, 4,347,999, Cl. 248-73.000.
Suzuki, Suzuo; Nakagawa, Yasuhiko; Aihara, Hisamoto; and Matsumoto, Yasuo, 4,347,825, Cl. 123-537.000.
Takahashi, Koichi; Higuchi, Megumu; and Watanabe, Minoru, 4,347,780, Cl. 91-375.00A.
Yanagishima, Takayuki; and Seko, Yasutoshi, 4,348,663, Cl. 340-576.000.
Nobbe, Paul J. Method and device for producing slotted concrete walls in place. 4,348,344, Cl. 264-31.000.
Noda, Azusa: *See—*
Takemura, Hiroo; and Noda, Azusa, 4,347,909, Cl. 180-219.000.
Noda Institute for Scientific Research: *See—*
Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, 4,348,477, Cl. 435-172.000.
Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, 4,348,478, Cl. 435-172.000.
Noe, James C.; and Friedman, David W., to Garrett Corporation, The. Heat-actuated space conditioning unit with bottoming cycle. 4,347,711, Cl. 62-160.000.
Noe, James C.: *See—*
Kinsell, Robert C.; and Noe, James C., 4,347,714, Cl. 62-402.000.
Noethe, Bjoern, to Siemens Aktiengesellschaft. Sealing materials for electrical and optical communication cables and cable connectors. 4,348,307, Cl. 528-49.000.
Nolan, James J.: *See—*
Coakley, John E.; and Nolan, James J., 4,348,058, Cl. 299-17.000.
Nomura, Ken; Igashira, Toshihiko; and Abe, Seikou, to Nippon Soken, Inc. Fuel evaporator for internal combustion engine. 4,347,826, Cl. 123-549.000.
Nomura, Suguru: *See—*
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.
Nordson Corporation: *See—*
Harjar, Martin J., 4,348,040, Cl. 285-175.000.
Nordstrom, Claes. Pallet for use as a load-carrying support. 4,347,794, Cl. 108-51.100.
Norland Corporation: *See—*
Congdon, George L., 4,347,849, Cl. 128-419.00P.
Northern Telecom Limited: *See—*
Chu, Pak-Jong, 4,348,559, Cl. 200-11.00R.
Hope, Thomasz S.; and Fombellida, Miguel, 4,347,697, Cl. 57-9.000.
Norton Company: *See—*
Newcomb, William E., 4,347,631, Cl. 2-423.000.
Novacek, Miroslav: *See—*
Pavek, Miloslav; Novacek, Miroslav; Fantl, Jiri; Kara, an; and Kasparek, Zdenek, 4,347,649, Cl. 28-254.000.
Novoselac, John, to Joy Manufacturing Company. Centrifuge apparatus. 4,347,971, Cl. 233-20.00R.
Nowack, Gerhard P.: *See—*
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 4,348,370, Cl. 423-362.000.
Noyes Bros. Pty. Limited: *See—*
Deamer, Charles R., 4,348,149, Cl. 414-458.000.
Nozaki, Tadatoshi: *See—*
Okabayashi, Hidekazu; Higuchi, Kohei; and Nozaki, Tadatoshi, 4,348,746, Cl. 365-182.000.
NSK-Warner K.K.: *See—*
Imai, Hironobu, 4,347,992, Cl. 242-68.400.
Nuebauer, Josef: *See—*
Werner, Arnold; Ennen, Peter; Nuebauer, Josef; Flaig, Hans; and Allgaier, Juergen, 4,348,753, Cl. 368-188.000.
Nussbaum, Theodore W., to Texaco Inc. Dual spectra well logging system. 4,348,671, Cl. 340-853.000.
Nutriscarch Company: *See—*
Lynch, Cheryl J.; Lin, Chifa F.; and Melachouris, Nicholas, 4,348,420, Cl. 426-272.000.
Nylund, Olov, to AB Asea-Atom. Fuel assembly for a boiling nuclear reactor. 4,348,355, Cl. 376-434.000.
Oak Industries Inc.: *See—*
Golbeck, Bernard J.; Lewandowski, Raymond F.; Rentzsch, Donald A.; and Richardson, Lonnie J., 4,348,569, Cl. 200-155.00R.
O'Brien, Steven M., to Sperry Corporation. High speed byte shifter error checking circuits. 4,348,742, Cl. 364-900.000.
Occidental Chemical Corporation: *See—*
King, Peter F., 4,348,294, Cl. 252-142.000.
Occidental Oil Shale, Inc.: *See—*
Ricketts, Thomas E., 4,347,789, Cl. 102-275.300.
Oce-Nederland B.V.: *See—*
Sessink, Bernardus W. L. M., 4,348,102, Cl. 355-14.0SH.
Odajima, Akira: *See—*
Hamada, Minoru; Nakamura, Nobuyuki; and Odajima, Akira, 4,347,948, Cl. 220-404.000.
O'Dette, John H.; and Jack, Stanton E., to Alcan Research and Development Limited. Aluminum powder blasting slurry sensitizer. 4,348,242, Cl. 149-7.000.
O'Donnell, John F., to Safelex Systems. Mounting assembly of controlled resilience for basketball goal hoop. 4,348,022, Cl. 273-1.50R.
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, to Bayer Aktiengesellschaft. Phosphonoformaldehyde, a process for its preparation and its use as an intermediate product for the preparation of medicaments. 4,348,332, Cl. 260-502.40R.
Oettinger, Peter E., to Thermo Electron Corporation. Thermionic laser. 4,348,765, Cl. 372-78.000.
Officine Meccaniche Pavesi & C. S.p.A.: *See—*
Barrera, Giorgio, 4,347,657, Cl. 29-596.000.
Officine Savio S.p.A.: *See—*
Bertagnoli, Leopoldo, 4,347,719, Cl. 66-91.000.
Ogasawara, Fumihiro: *See—*
Takahashi, Shuichi; Ogasawara, Fumihiro; and Ohta, Syuichi, 4,348,697, Cl. 358-286.000.
Ogawa, Ryota, to Asahi Kogalu Kogyo Kabushiki Kaisha. Zoom lens having high zoom ratio including wide angle range. 4,348,082, Cl. 350-423.000.
Ogawa, Yasuyuki: *See—*
Sato, Toshio; and Ogawa, Yasuyuki, 4,347,999, Cl. 248-73.000.
Ogden, Ralph. Beverage carbonator device. 4,347,783, Cl. 99-323.100.
Ogino, Shigeo: *See—*
Kojima, Shinichi; Koide, Ten; Ogino, Shigeo; Tsuchiya, Toshiro; and Kameno, Yoshito, 4,348,386, Cl. 424-177.000.
Ogino, Yukio: *See—*
Kamio, Hiroyoshi; Ogino, Yukio; and Nakamura, Kouichi, 4,348,498, Cl. 525-13.000.
Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Signal level display apparatus. 4,348,666, Cl. 340-753.000.

Ogiwara, Osao, to Akebono Brake Industry Company, Ltd. Friction material. 4,348,490, Cl. 523-156.000.
Ohara, Wataru: *See—*
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Ohara, Wataru, 4,348,120, Cl. 400-124.000.
Ohashi, Kenji, to Murata Kikai Kabushiki Kaisha. Method and apparatus for stopping packages in automatic winder. 4,347,990, Cl. 242-36.000.
Ohashi, Michihiro: *See—*
Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, 4,347,812, Cl. 123-90.550.
Ohba, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Display device providing magnified indication. 4,347,803, Cl. 116-28.100.
Ohki, Kenji; Tokuyama, Mistru; Sagae, Masayuki; and Kawabuchi, Kenji, to Kao Soap Co., Ltd. Porous sheet and process for preparation thereof. 4,347,844, Cl. 128-287.000.
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, to NHK Spring Co., Ltd.; and Yokohama Kiko Co., Ltd. Reflector. 4,348,463, Cl. 428-429.000.
Ohno, Takeshi: *See—*
Mino, Masao; and Ohno, Takeshi, 4,347,991, Cl. 242-43.200.
Ohno, Yukihiro: *See—*
Suzuki, Shigeru; Ohno, Yukihiro; Yanagawa, Nobuyuki; and Kawaishi, Yasunori, 4,348,106, Cl. 355-75.000.
Ohta Company Limited: *See—*
Iseki, Kazuo, 4,347,645, Cl. 16-291.000.
Ohta, Syuichi: *See—*
Takahashi, Shuichi; Ogasawara, Fumihiro; and Ohta, Syuichi, 4,348,697, Cl. 358-286.000.
Ohtaki, Shohei; and Yamada, Masanori, to Canon Kabushiki Kaisha. Slide switch. 4,348,564, Cl. 200-67.00F.
Ohya, Takeji, to Toyo Kogyo Co., Ltd. Rear side door structure for a four-door type automobile. 4,348,046, Cl. 296-201.000.
Oishi, Norio; Shimazu, Toshinari; Suganami, Takuya; and Masuda, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Seal-ring type shaft-sealing device. 4,348,029, Cl. 277-26.000.
Ojima, Masahiro: *See—*
Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,348,461, Cl. 428-409.000.
Okabayashi, Hidekazu; Higuchi, Kohei; and Nozaki, Tadatoshi, to Nippon Electric Co., Ltd. Semiconductor integrated circuit device having a plurality of insulated gate field effect transistors. 4,348,746, Cl. 365-182.000.
Okabe, Tohru: *See—*
Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, 4,348,201, Cl. 8-94.180.
Okada, Syohiti: *See—*
Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, 4,348,201, Cl. 8-94.180.
Okamoto, Fumio; and Kato, Katsuhiro, to RCA Corporation. Method for preparing inorganic sulfides. 4,348,299, Cl. 252-301.40S.
Okamoto, Kazuyoshi: *See—*
Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, 4,348,201, Cl. 8-94.180.
Okamoto, Takeshi: *See—*
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Olin Corporation: *See—*
Duncan, Budd L.; and Madden, Ian L., 4,348,372, Cl. 423-497.000.
Saeman, Walter C., 4,348,371, Cl. 423-475.000.
Oliver, Larry R., to Dayco Corporation. Torque-sensing pulley and drive system. 4,348,197, Cl. 474-28.000.
Olsen, Everett O., to Foxboro Company, The. Chart recording apparatus. 4,348,683, Cl. 346-31.000.
Olson, Lorimer, to WGM Safety Corp. Truck winch assembly. 4,348,151, Cl. 414-542.000.
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Bhatti, Mohinder S.; and Marzocchi, Alfred, 4,348,216, Cl. 65-1.000.
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Parenti, Joseph A.; and Charles, Malcolm J., to B & J Manufacturing Company, by said Malcolm Jean Charles. Blower and dust collecting machine and method of operation. 4,348,057, Cl. 299-12.000.

Pascuzzi, E. Anthony: *See—*
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Pauls, Walter L.; and Dunleavy, Raymond A., III, to American Can Company. System for applying binding agents to fibrous webs. 4,348,251, Cl. 156-500.000.

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Perucchi, Norberto, to Eta A.G. Ebauches-Fabrik. Electronic watch with movable detecting member. 4,348,752, Cl. 368-187.000.

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Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Safety valve. 4,347,867, Cl. 137-460.000.

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Petrolite Corporation: *See—*
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Jensen, Bruce A., 4,348,259, Cl. 203-1.000.
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 4,348,370, Cl. 423-362.000.
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Pile Dynamics, Inc.: *See—*
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Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., to Institute Po Microbiologia. Method of obtaining glucose isomerase. 4,348,481, Cl. 435-234.000.

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Post Office, The: *See—*
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Ray, William F.; and Davis, Rex M., to Chloride Group Limited. Variable reluctance electric motor systems. 4,348,619, Cl. 318-139.000.
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Raytheon Company: *See*—
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Assmann, Helmut; Brandau, Egbert; Dorr, Wolfgang; Mathieu, Viktor; and Dichtjar, Gerhard, 4,348,339, Cl. 264-0.500.
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Rees, Karl, to Sulzer Brothers Limited. Combustion chamber wall. 4,347,810, Cl. 122-6.00A.
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Montavon, Marc; and Reiner, Roland, 4,348,518, Cl. 544-026.000.
Reist, Walter, to Ferag AG. Method of interconnecting and manipulating printed products. 4,347,694, Cl. 53-399.000.
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Dougherty, John J., 4,348,734, Cl. 364-721.000.
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Marklund, Erland; and Lindstrom, Lars, 4,348,145, Cl. 414-288.000.
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Resnick, Paul R.: *See*—
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,348,310, Cl. 524-167.000.
Rexnord Inc.: *See*—
Acheson, John L., 4,348,159, Cl. 417-220.000.
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Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,348,311, Cl. 524-530.000.
Ribka, Joachim: *See*—
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Rice, Larry J., to International Business Machines Corporation. Tabulation rack with spring pin holding. 4,348,124, Cl. 400-298.000.
Rice, Larry J.: *See*—
Abbott, Clinton E.; and Rice, Larry J., 4,348,123, Cl. 400-298.000.
Rice, Steven J.; and Sherman, Donald E., to Lockheed Corporation. Digital-fault loop probe and system. 4,348,760, Cl. 371-20.000.
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Richardson, Christopher K., to Plessey Handel und Investments AG. Transceivers. 4,348,757, Cl. 370-32.000.
Richardson, David A., to Foxboro Company, The. Instrumentation system with electric signal transmitter. 4,348,673, Cl. 340-870.180.
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Golbeck, Bernard J.; Lewandowski, Raymond F.; Rentzsch, Donald A.; and Richardson, Lonnie J., 4,348,569, Cl. 200-155.00R.
Rickelton, William A.; Robertson, Allan J.; and Burley, David R., to American Cyanamid Company. Selective removal of cobalt(II) from aqueous solutions with phosphinic extractants. 4,348,367, Cl. 423-139.000.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Downhole delay assembly for blasting with series delay. 4,347,789, Cl. 102-275.300.
Ricoh Company, Ltd.: *See*—
Funato, Hiroyoshi, 4,348,080, Cl. 350-3.710.
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Kozima, Akio; Akutsu, Eiichi; and Ichizuka, Kiyomi, 4,348,470, Cl. 430-72.000.
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Robert Bosch GmbH: *See—*
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Roberts, John S.; Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Cracking process and catalyst for same. 4,348,304, Cl. 252-455.00Z.
Roberts, William J., to Eltra Corporation. Ignition spark advance using a constant peak to peak amplitude timing signal with a frequency tied to engine speed. 4,347,819, Cl. 123-415.000.
Robertsen, Anthony L.; and McInnis, Andrew M., to Sheldon Industries Inc. Automatically relegendable keyboard. 4,348,660, Cl. 340-365.0VL.
Robertshaw Controls Company: *See—*
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Robertson, Allan J.: *See—*
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Robeson, Lloyd M.; and Szabo, Ted T., to Union Carbide Corporation. Polyarylate compositions having improved hydrolytic stability. 4,348,500, Cl. 525-65.000.
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Rockley, Mark G.; and Mains, Gilbert J., to Board of Regents for Oklahoma Agriculture and Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Sciences. Method of depositing doped amorphous semiconductor on a substrate. 4,348,428, Cl. 427-54.100.
Rockwell International Corporation: *See—*
Cavalleri, Robert J.; Moon, Lamar F.; and Hon, John F., 4,348,764, Cl. 372-58.000.
Clendening, Steven J., 4,348,640, Cl. 328-41.000.
Fisher, Harry W.; and Perrine, Eugene B., 4,347,731, Cl. 73-3.000.
Harrington, Timothy A., 4,348,642, Cl. 330-149.000.
Loyd, Morris S.; and McGann, Timothy W., 4,348,247, Cl. 156-156.000.
Rosman, Irwin E.; and Wagner, William R., 4,347,896, Cl. 165-166.000.
Rode, Heinz A.; Fromel, Meter; and Beaver, Perry L., to Republic Steel Corporation. Method and apparatus for monitoring bearing wear. 4,348,665, Cl. 340-682.000.
Rodemann, Alfred H.: *See—*
Breglia, Denis R.; and Rodemann, Alfred H., 4,348,185, Cl. 434-43.000.
Rogener, Peter, to Universal Maschinen-u Apparatebau GmbH & Co., KG. Apparatus for de-burring of workpieces. 4,347,957, Cl. 225-93.000.
Rogier, Edgar R., to Henkel Corporation. Cycloaliphatic alcohols. 4,348,543, Cl. 568-823.000.
Rohr, Otto: *See—*
Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, 4,348,221, Cl. 71-94.000.
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Rosati, Robert L., to Pfizer Inc. Photocatalyzed process for producing carbapenams and carbapen-2-ems. 4,348,264, Cl. 204-158.00R.
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Pirz, Frank C.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,348,550, Cl. 179-1.0SD.
Rosenthal, Heinrich; Schinkel, Ingo; and Eger, Gunter, to Wolff Walsrode Aktiengesellschaft. Sealable multilayer film of polyolefins. 4,348,457, Cl. 428-349.000.
Rosman, Irwin E.; and Wagner, William R., to Rockwell International Corporation. Internally manifolded unibody plate for a plate/fin-type heat exchanger. 4,347,896, Cl. 165-166.000.
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Rothwell, Harold L., Jr.: *See—*
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Roy, Irene. Actuator for capture type combination system in organs. 4,347,774, Cl. 84-345.000.
Rozmus, Walter J., to Kelsey-Hayes Company. Method and apparatus for cyclic degassing particulate material. 4,348,212, Cl. 55-2.000.
Ruckel, P. Jay, to Conoco Inc. Additive composition and method of using same. 4,348,237, Cl. 106-122.000.
Rude, Carl A.: *See—*
Akerberg, Denis W.; Huffman, George W.; and Rude, Carl A., 4,348,343, Cl. 264-29.500.
Rudish, Ronald M.: *See—*
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Ruhlmann, Edmond, to Ciba-Geigy Corporation. Azo-dyes, their preparation and use. 4,348,318, Cl. 260-153.000.
Rumble, Warwick F.: *See—*
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Runyan, Gary D. Collapsibly supported outdoor cooking apparatus. 4,347,830, Cl. 126-9.00R.
Ruppel, Wolfgang; Hetzler, Ullrich; Vogt, Horst; and Wurfel, Peter. Ferroelectric or pyroelectric sensor utilizing a sodium nitrite layer. 4,348,611, Cl. 313-388.000.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl G., 4,347,761, Cl. 74-732.000.
Saari, Risto. Method for distilling a liquid. 4,348,261, Cl. 203-25.000.
Sado, Ryoichi, to Shin-Etsu Polymer Co., Ltd. Key-board switch unit. 4,348,557, Cl. 200-5.00A.
Saeman, Walter C., to Olin Corporation. Process for the recovery of calcium salts from calcium hypochlorite process effluents. 4,348,371, Cl. 423-475.000.
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Okumura, Koji; and Saeva, Franklin D., 4,348,473, Cl. 430-296.000.
Safelex Systems: *See—*
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Sagae, Masayuki: *See—*
Ohki, Kenji; Tokuyama, Mistru; Sagae, Masayuki; and Kawabuchi, Kenji, 4,347,844, Cl. 128-287.000.
Sagisaka, Yasuo; Kondo, Toshio; and Tajima, Masahiko, to Nippondenso Co., Ltd. Air-fuel ratio controlling method and apparatus therefor. 4,348,728, Cl. 364-431.060.
Sai-Halasz, George A.: *See—*
Esaki, Leo; and Sai-Halasz, George A., 4,348,686, Cl. 357-30.000.
St. Clair, John C. Draining, irrigating and aeration of soil and heating or cooling of soil. 4,348,135, Cl. 405-36.000.
Saint-Gobain Vitrage: *See—*
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St-Noel, Wilhelm: *See—*
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; St-Noel, Wilhelm; Lantzsch, Reinhard; and Harhold, Albrecht, 4,348,323, Cl. 549-362.000.
Saito, Masaaki; Kawamura, Yoshihisa; Sugo, Yuko; and Inoue, Mitsumasa, to Nissan Motor Company, Limited. Fuel/air mixture supply system with additional air supply. 4,347,816, Cl. 123-308.000.
Saito, Masaaki, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine having rotary valve and step motor. 4,347,821, Cl. 123-440.000.
Saito, Narimasa: *See—*
Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, 4,348,477, Cl. 435-172.000.
Nakano, Eiichi; Masuda, Tsutomu; Saito, Narimasa; and Fukushima, Danji, 4,348,478, Cl. 435-172.000.
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Tanaka, Kazuyuki; Ueki, Yoshiharu; Kunugi, Yoshiro; and Sakaguchi, Shozaburo, 4,348,616, Cl. 315-314.000.
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Sakakibara, Sakuichi; Sugisawa, Ko; and Kimura, Takashi, to House Food Industrial Company Limited. Process for reconstituting dehydrated food. 4,348,421, Cl. 426-394.000.
Sakakibara, Shinsuke: *See—*
Kobayashi, Kengo; Inaba, Hajimu; and Sakakibara, Shinsuke, 4,348,623, Cl. 318-568.000.

Sakakibara, Shiro; Tsukamoto, Kazumasa; Sakai, Takahiro; and Terakura, Yukio, to Aisin Warner K.K. One-way brake. 4,347,763, Cl. 74-789.000.

Sako, Hironobu: *See—*
Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, 4,348,226, Cl. 75-35.000.

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Salaun, Harold L., Jr.: *See—*
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Salkhad Pty. Limited: *See—*
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Salmond, William E., to General Dynamics, Pomona Division. Common aperture dual mode seeker antenna. 4,348,677, Cl. 343-729.000.

Salverson, David R.: *See—*
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Sanders, Andrea; and Kim, Leo, to Shell Oil Company. Alkoxyalkanoic acid preparation. 4,348,509, Cl 562-538.000.

Sanders, James M.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,347,858, Cl. 131-276.000.

Sanderson, Edward L., to United States of America, Navy. Oceanographic transducer. 4,347,738, Cl. 73-170.00A.

Sandhu, Avtar S., to Bechtel International Corporation. Slurry pipeline simulation method. 4,348,206, Cl. 23-230.00A.

Sandoz Ltd.: *See—*
Fehr, Theodor; Stadler, Paul; and Stutz, Peter, 4,348,392, Cl. 424-246.000.
Stutz, Peter; Fehr, Theodor; and Stadler, Paul, 4,348,391, Cl. 424-246.000.

Sangamo Weston, Inc.: *See—*
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Sapp, Michael L. Method for reading typing and spacing errors. 4,348,189, Cl. 434-227.000.

Sarges, Reinhard, to Pfizer Inc. Intermediates in the preparation of chiral hydantoins. 4,348,526, Cl. 548-309.000.

Sasayama, Takao; and Suda, Seiji, to Hitachi, Ltd. Engine control system including non-volatile memory and correction data transfer method. 4,348,729, Cl. 364-431.120.

Sato, Hiroshi: *See—*
Shimanuki, Shizuka; Matsumoto, Toshimi; Sato, Hiroshi; Onuma, Tsutomu; and Kirihara, Seishin, 4,348,131, Cl. 403-272.000.

Sato, Toshio; and Ogawa, Yasuyuki, to Nissan Motor Company, Limited; and Kato Hatsujo Kaisha Limited. Holder for a wire member. 4,347,999, Cl. 248-73.000.

Satoh, Toshio: *See—*
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, 4,348,410, Cl. 424-309.000.

Sauer, Don R., to National Semiconductor Corporation. Current comparator circuit with deadband. 4,348,602, Cl. 307-530.000.

Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., to Essex Group, Inc. Power insertable polyamide-imide coated magnet wire. 4,348,460, Cl. 428-383.000.

Sawan, Anis S. Precision pipe cutter and reamer combination. 4,347,634, Cl. 7-157.000.

Schaller, Waldemar: *See—*
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Scharfenberger, James A., to Ransburg Corporation. Variable low-pressure fluid color change cycle. 4,348,425, Cl. 427-8.000.

Schaumann, Wolfgang: *See—*
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Scheerer, Rainer; Ranz, Erwin; and Lohmann, Joachim W., to Agfa-Gevaert Aktiengesellschaft. Light sensitive photographic recording material and the use thereof for the production of photographic images. 4,348,474, Cl. 430-382.000.

Scheithauer, Richard A.: *See—*
Gingerich, Richard G. W.; Vanderpool, Clarence D.; Scheithauer, Richard A.; and Ritsko, Joseph E., 4,348,224, Cl. 75-0.5AA.

Schenk, Wolfgang: *See—*
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, 4,348,334, Cl. 260-505.00C.

Schering Aktiengesellschaft: *See—*
Nickolson, Robert; Kerb, Ulrich; Wiechert, Rudolf; Alig, Leo; Furst, Andor; and Muller, Marcel, 4,348,327, Cl. 260-397.100.

Schering Corporation: *See—*
Lee, Bong K.; Wagman, Gerald H.; Rane, Dinanath F.; Marquez, Joseph A.; and Daniels, Peter J. L., 4,348,516, Cl. 536-10.000.
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Scheuchzer, Fredy; and Buhler, Fritz, to Les Fils d'Auguste Scheuchzer S.A. Railroad rail grinding truck. 4,347,688, Cl. 51-178.000.

Schiemann, Wolfram. Closure for a canister. 4,347,954, Cl. 222-484.000.

Schinkel, Ingo: *See—*
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Schipper, Hendricus H., to B.V. Machinefabriek v/h Pannevis & Zn. Method and device for removing a fluid from a mixture of a fluid and a solid substance. 4,348,290, Cl. 210-783.000.

Schlayer, Wolfgang; and Hemminger, Herbert, to International Standard Electric Corporation. Bearing for faceplate panels of color-picture tubes. 4,348,017, Cl. 269-296.000.

Schluer, Manfred: *See—*
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Schlumberger Technology Corporation: *See—*
Clavier, Christian M. J.; Hepp, Vincent R.; and Dumestre, Alexis C., 4,348,748, Cl. 367-25.000.

Schmidt, Hans-Georg, to Daimler-Benz Aktiengesellschaft. Air-compressing internal combustion engine with a precombustion chamber. 4,347,815, Cl. 123-269.000.

Schmidt, Hans-Georg, to Dynamit Nobel AG. Substituted lactones and processes for their preparation. 4,348,535, Cl. 560-124.000.

Schmidt, Walter, to BBC Brown, Boveri & Company, Ltd. Process for the preparation of an optically transparent and electrically conductive film pattern. 4,348,255, Cl. 156-656.000.

Schmitt, Edward L.; Caroleo, Steven J.; Bolam, Charles W.; and Conley, Richard W., to Kerotest Manufacturing Corp. Plastic valve assembly. 4,348,006, Cl. 251-288.000.

Schmitt, Frederick L.: *See—*
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Schmitz, Lawrence S., to Hughes Aircraft Company. Non-volatile random access memory having non-inverted storage. 4,348,745, Cl. 365-154.000.

Schneider, Franz: *See—*
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Schnell, William J.: *See—*
George, Richard W.; and Schnell, William J., 4,348,280, Cl. 210-101.000.

Schnurmann, Henri D., to International Business Machines Corporation. Automatic testing of complex semiconductor components with test equipment having less channels than those required by the component under test. 4,348,759, Cl. 371-20.000.

Schoenberger, Norman, Jr.: *See—*
Kost, William E.; and Schoenberger, Norman, Jr., 4,347,969, Cl. 229-34.0HW.

Schofield, Miles E. Funnel. 4,347,878, Cl. 141-300.000.

Scholl, Frederick W.: *See—*
Zory, Peter S.; Scholl, Frederick W.; and Lockwood, Harry F., 4,347,655, Cl. 29-589.000.

Scholl, Hans; and Fischer, Jochen, to Kochs Adler AG. Sewing device for producing fastening stitches and tack stitches. 4,347,797, Cl. 112-121.120.

Scholz, John A.: *See—*
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Schomann, Klaus D., to BASF Aktiengesellschaft. Magnetic devices for changing video recordings. 4,348,698, Cl. 360-14.000.

Schonfeld, Arnold; Eibner, Jules A.; and Bastian, Franklin E., to Sperry Corporation. Duplex printing apparatus. 4,348,101, Cl. 355-14.00R.

Schonfeld, Arnold: *See—*
Mittal, Faquir C.; Arrison, Frank J.; and Schonfeld, Arnold, 4,348,705, Cl. 360-98.000.

Schoubye, Peter C. S., to Haldor Topsoe A/S. Process for the preparation of sulfuric acid. 4,348,373, Cl. 423-522.000.

Schreder, Felix: *See—*
Fischer, Karl; and Schreder, Felix, 4,348,581, Cl. 219-460.000.

Schriber, Gene A.: *See—*
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Schroder, Joris, to Inventio AG. Roll guide shoe for elevators or the like. 4,347,916, Cl. 187-95.000.

Schuler, Malcolm R.: *See—*
Gubitose, Nicholas F.; Schuler, Malcolm R.; and Patterson, David L., 4,348,365, Cl. 422-249.000.

Schultz, Robert J.; and Starks, Fred W., to Starks Associates, Inc. N-(phosphonacetyl)-L-aspartic acid salts with piperazine, cyclohexylamine and calcium. 4,348,522, Cl. 544-358.000.

Schumacher, Ralf: *See—*
Struck, Carl-Heinz; and Schumacher, Ralf, 4,348,258, Cl. 202-255.000.

Schuss, Werner, to Siemens Aktiengesellschaft. Device for releasably connecting a head part to a handle part of a dental handpiece. 4,348,180, Cl. 433-126.000.

Schwarz, Hans-Helmut: *See—*
Serini, Volker; Neumann, Rainer; Friedhofen, Gerhard; Freitag, Dieter; Heuser, Jurgen; and Schwarz, Hans-Helmut, 4,348,542, Cl. 568-727.000.

Schwind, David R. Energy control device. 4,348,750, Cl. 367-140.000.

Schwing, Gregory W., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,348,220, Cl. 71-92.000.

Scott, Lex A.; Mosley, William H., Jr.; and Andren, Carl F., to E-Systems, Inc. Digital baseband carrier recovery circuit. 4,348,641, Cl. 329-50.000.

Scott, Michael J., to Allflex International Limited. Relating to devices for the closure of fluid flow lines. 4,347,868, Cl. 137-462.000.

Scott, Stephen D.: *See*—
Kantner, Harold H.; and Scott, Stephen D., 4,347,700, Cl. 60-325.000.

Scrivo, Jerry V., to Ex-Cell-O Corporation. Vehicle bumper assembly. 4,348,042, Cl. 293-120.000.

Seachman, Ned J., to Xerox Corporation. Twisting geometry optical system utilizing imaging array with time delay segments. 4,348,593, Cl. 250-578.000.

Secon, Edward, to Sherwood Corporation, The. Lawn umbrella. 4,347,862, Cl. 135-20.00R.

Seemann, Robert A. All season window. 4,347,835, Cl. 126-431.000.

Seitetsu Kagaku Co., Ltd.: *See*—
Hayashi, Saburo; Okada, Syohiti; Okamoto, Kazuyoshi; Mizutani, Mochifumi; Isono, Teizo; Osada, Toshio; Okabe, Tohru; and Adachi, Mitsuji, 4,348,201, Cl. 8-94.180.

Seitter, Wolf: *See*—
Goertler, Horst; Hetzel, Friedrich; Prohaska, Hans; Rachner, Horst; Seitter, Wolf; and Swoboda, Josef, 4,348,655, Cl. 340-73.000.

Seki, Michinori, to Tokushu Aerosol Co. Ltd. Ornamental spraying apparatus and a sprayer therefor. 4,347,980, Cl. 239-289.000.

Seko, Yasutoshi: *See*—
Yanagishima, Takayuki; and Seko, Yasutoshi, 4,348,663, Cl. 340-576.000.

Sellier, Daniel: *See*—
Cukier, Maurice; and Sellier, Daniel, 4,348,737, Cl. 364-900.000.

Senaha, Susumu: *See*—
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.

Senzaki, Takaya; and Murao, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. FM-CW Radar system for use in an automotive vehicle. 4,348,675, Cl. 343-7.0VM.

Serini, Volker; Neumann, Rainer; Friedhofen, Gerhard; Freitag, Dieter; Heuser, Jurgen; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for the production of mixtures of alkylated aromatic hydroxy compounds. 4,348,542, Cl. 568-727.000.

Sessink, Bernardus W. L. M., to Oce-Nederland B.V. Electrographic apparatus with control system for fixing powder images by heat and contact. 4,348,102, Cl. 355-14.0SH.

Settembre, Richard J. Safety binding for nordic skis. 4,348,036, Cl. 280-615.000.

Seufert, Gerhard, to Herrin, Melvin Bernard. Process and apparatus for forming flexible fold lines in thermoplastic sheets. 4,348,449, Cl. 428-167.000.

Sharma, Satya P.: *See*—
Draper, Clifton W.; and Sharma, Satya P., 4,348,263, Cl. 204-29.000.

Sharp Kabushiki Kaisha: *See*—
Nakatani, Hiroshi; Ishida, Masahide; and Yamamoto, Hachizou, 4,348,551, Cl. 179-1.0SM.

Sharp, Paul H., to Marmon Company. Variable speed motor system. 4,348,625, Cl. 318-757.000.

Shasha, Baruch S.; and Abbott, Thomas P., to United States of America, Agriculture. Starch adduct encasement of particulate elastomers. 4,348,492, Cl. 524-52.000.

Shaw, Julius. Insulating and packaging material of metal foil-nonwoven glass fabric. 4,348,450, Cl. 428-182.000.

Shedd, Charles D.: *See*—
Drzal, Robert S.; and Shedd, Charles D., 4,348,459, Cl. 428-379.000.

Shefford, Roger A., to Koninklijke Emballage Industrie Van Leer B.V. Enclosure member substantially impermeable to the transmission of solvents and fuels. 4,348,436, Cl. 428-35.000.

Sheldon Industries Inc.: *See*—
Robertsen, Anthony L.; and McInnis, Andrew M., 4,348,660, Cl. 340-365.0VL.

Shell Oil Company: *See*—
Blytas, George C.; and Diaz, Zaida, 4,348,368, Cl. 423-226.000.
Krishnaswamy, Srinivasan, 4,347,747, Cl. 73-861.180.
Sanders, Andrea; and Kim, Leo, 4,348,509, Cl. 562-538.000.
Shepley, John D.; and Muijs, Herman M., 4,348,244, Cl. 156-72.000.

Shellenberger, Charles R.: *See*—
Alter, William F.; DeBoer, Jonathan J.; and Shellenberger, Charles R., 4,347,926, Cl. 198-388.000.

Shelnut, James; and Cohen, Richard J., to Polychrome Corporation. Positive acting composition yielding pre-development high visibility image after radiation exposure comprising acid free novolak, diazo oxide and acid sensitive dyestuff. 4,348,471, Cl. 430-165.000.

Shemano, Irving: *See*—
Imondi, Anthony R.; and Shemano, Irving, 4,348,407, Cl. 424-300.000.

Shenk, Edwin K., to Polaroid Corporation. Lens movement actuated reference and sequencing means for cameras having unidirectional automatic focusing. 4,348,089, Cl. 354-195.000.

Shepard, Francis H., Jr.: *See*—
Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., 4,348,738, Cl. 364-900.000.

Shepherd, Robert G., to American Cyanamid Company. Antiatherosclerotic and hypolipidemic 4-(monoalkylamino)phenyl alkane, alkene and alkyne carbinols, aldehydes, carboxylic acids and derivatives. 4,348,399, Cl. 424-263.000.

Shepley, John D.; and Muijs, Herman M., to Shell Oil Company. Lubricating compositions for primary backing fabrics used in the manufacture of tufted textile articles. 4,348,244, Cl. 156-72.000.

Sheppard, James A.: *See*—
Consolazio, George A.; Sheppard, James A.; and Laramee, Benjamin E., 4,348,424, Cl. 427-4.000.

Sherman, Donald E.: *See*—
Rice, Steven J.; and Sherman, Donald E., 4,348,760, Cl. 371-20.000.

Sherman, Robert: *See*—
Barnes, Philip E.; Mayo, Millard G.; and Sherman, Robert, 4,348,155, Cl. 416-46.000.

Sherry, Charles Edward: *See*—
Price, Donald R., 4,347,884, Cl. 152-158.000.

Sherwood Corporation, The: *See*—
Secon, Edward, 4,347,862, Cl. 135-20.00R.

Shetty, Jayarama K.: *See*—
Kinsella, John E.; and Shetty, Jayarama K., 4,348,479, Cl. 435-183.000.

Shibata, Tsugio. Pressure converting apparatus. 4,348,161, Cl. 417-403.000.

Shields, Theodore C., to Ashland Oil, Inc. Preparation of thionamide compounds by sulfuration of imines. 4,348,523, Cl. 544-399.000.

Shigematsu, Kazuo: *See*—
Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,348,461, Cl. 428-409.000.

Shim, Kyung S., to Stauffer Chemical Company. Novel phosphoramides, lubricating compositions and method of improving wear and extreme pressure characteristics of lubricating oil. 4,348,291, Cl. 252-49.900.

Shima, Yasuhusa: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,348,751, Cl. 368-82.000.

Shimadzu Corporation: *See*—
Yano, Shozo; Miyake, Toshiyuki; Fujinaga, Yasuhiro; Koomoto, Akira; Kawara, Toshio; Yagi, Akio; Tsuji, Tomohiro; and Nagaoka, Tadashi, 4,347,903, Cl. 177-25.000.

Shimamura, Kouichi, to Sonix Limited. Plating means. 4,348,267, Cl. 204-206.000.

Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,348,198, Cl. 474-82.000.
Terada, Masao, 4,348,200, Cl. 474-160.000.

Shimano, Keizo, to Shimano Industrial Company Limited. Bicycle derailleur having a reduced lateral width. 4,348,198, Cl. 474-82.000.

Shimanuki, Shizuka; Matsumoto, Toshimi; Sato, Hiroshi; Onuma, Tsutomu; and Kirihara, Seishin, to Hitachi, Ltd. Welded structure having improved mechanical strength and process for making same. 4,348,131, Cl. 403-272.000.

Shimazaki, Katsunori: *See*—
Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, 4,348,226, Cl. 75-35.000.

Shimazu, Toshinari: *See*—
Oishi, Norio; Shimazu, Toshinari; Suganami, Takuya; and Masuda, Takahiro, 4,348,029, Cl. 277-26.000.

Shimizu, Tsuyoshi: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,348,751, Cl. 368-82.000.

Shin-Etsu Polymer Co., Ltd.: *See*—
Sado, Ryoichi, 4,348,557, Cl. 200-5.00A.

Shinbori, Kenichi: *See*—
Katsuma, Makoto; Shinbori, Kenichi; Kiuchi, Masayoshi; and Alyfuku, Kiyoshi, 4,348,096, Cl. 354-289.000.

Shindow, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic lens meter. 4,348,108, Cl. 356-125.000.

Shinhokoku Steel Corporation: *See*—
Kunioka, Saburo; Kawaguchi, Hatsuo; and Ono, Minoru, 4,348,241, Cl. 148-6.350.

Shinuchi, Tadami: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, 4,348,410, Cl. 424-309.000.

Shiozaki, Shigeru: *See*—
Mitsuishi, Yukio; Shiozaki, Shigeru; Chujo, Takao; and Yokoyama, Takeyuki, 4,348,446, Cl. 428-148.000.

Shirasaki, Shinji: *See*—
Tsuzuki, Yoshihiko; Okazaki, Hiroshi; Shirasaki, Shinji; Matsuyama, Masahiro; Kobayashi, Masanobu; and Ito, Yoji, 4,348,653, Cl. 340-52.00F.

Shirota Denki Kozai Kabushiki-Kaisha: *See*—
Shirota, Kazunari, 4,348,182, Cl. 433-214.000.

Shirota, Kazunari, to Shirota Denki Kozai Kabushiki-Kaisha. Reinforcement wire for material for the impression of decayed tooth. 4,348,182, Cl. 433-214.000.

Shiun, Toshimi; Fujii, Hideo; and Kizaki, Yoshio, to Clarion Co., Ltd. Circuit for correcting data reading clock pulses. 4,348,762, Cl. 371-47.000.

Shmomura, Susumu: *See*—
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.

Shnitkin, Harold; and Smith, Peter W., to United Technologies Corporation. Multi-mode dual-feed array radar antenna. 4,348,679, Cl. 343-768.000.

Shonkwiler, Forest M.: *See*—
Shonkwiler, Gary L.; and Shonkwiler, Forest M., 4,348,054, Cl. 298-11.000.

Shonkwiler, Gary L.; and Shonkwiler, Forest M. Convertible adjustable bed vehicle. 4,348,054, Cl. 298-11.000.

Shook, Larry E.: *See—*
Gettig, William A.; and Shook, Larry E., 4,348,556, Cl. 200-5.00R.

SI Handling Systems, Inc.: *See—*
Nagahori, Katsuhiro, 4,347,792, Cl. 104-166.000.

Sibbel, Uwe. Watering system for flower pots and plant boxes. 4,347,687, Cl. 47-79.000.

Siccone, Ralph R. Direct/reflecting speaker system and triangular shaped enclosure. 4,348,552, Cl. 179-1.00E.

Sickles, James E., to PPG Industries, Inc. Electrostatic spray coating apparatus. 4,347,984, Cl. 239-707.000.

Siemens Aktiengesellschaft: *See—*
Heyneman, Guido, 4,348,160, Cl. 417-403.000.
Keller, Roman; and Kliesch, Gunter, 4,348,687, Cl. 357-79.000.
Muth, Klaus; and Federspieler, Philipp, 4,348,674, Cl. 343-5.0SA.
Noethe, Bjoern, 4,348,307, Cl. 528-49.000.
Schuss, Werner, 4,348,180, Cl. 433-126.000.
Skafvenstedt, Bengt; and Ahlgren, Sture, 4,348,118, Cl. 400-54.000.

Sievers, Kirk A., to Motorola, Inc. Stator fault detector for automotive alternator battery charging systems. 4,348,629, Cl. 322-99.000.

Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., to Du Pont de Nemours, E. I., and Company. Solutions of sulfonyl fluoride compounds and fluoropolymers. 4,348,310, Cl. 524-167.000.

Simic, Milutin, to Chevron Research Company. Plasticized sulfur composition. 4,348,233, Cl. 106-18.230.

Simon, Hans. Insulation for flat connectors. 4,348,070, Cl. 339-59.00R.

Simon, Martin, to General Electric Company. Magnetic field presetting circuit for an exciter field winding in an electrical propulsion system for traction vehicles. 4,348,620, Cl. 318-154.000.

Simpson, Robert B., to Fiberglas Canada Inc. Manufacture of glass fibre blowing wool. 4,347,985, Cl. 241-1.000.

Sims, Robert: *See—*
Gary, David A., 4,347,914, Cl. 182-142.000.

Singer Company, The: *See—*
Bair, Scott S., III, 4,347,643, Cl. 15-340.000.
Dotsko, Martin, 4,348,187, Cl. 434-44.000.
Moore, Randy W., 4,348,184, Cl. 434-42.000.

Singh, Gurnam, to Bourns Instruments, Inc. Pressure measuring apparatus. 4,347,745, Cl. 73-721.000.

Sippel, Charles, to LogEtronics, Inc. Camera positioning apparatus. 4,348,097, Cl. 354-293.000.

Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with substituted 3,6-diphenyl-3,4-dihydro-2H-1,3,5-oxadiazine-2,4-diones. 4,348,394, Cl. 424-248.570.

Sitt, Rudiger: *See—*
Kinast, Gunther; Muller, Lutz; Sitt, Rudiger; and Puls, Walter, 4,348,402, Cl. 424-267.000.

Sivan, Gideon: *See—*
Grossman, Gershon; Sivan, Gideon; Chefner, Tudor; and Matania, Eliyahu, 4,347,965, Cl. 228-107.000.

Skafvenstedt, Bengt; and Ahlgren, Sture, to Siemens Aktiengesellschaft. Paper transport means for a recording device. 4,348,118, Cl. 400-54.000.

Skelly, James K.; Evans, David G.; and Broadbent, Barrie, to Ciba-Geigy Corporation. Dyeing process. 4,348,203, Cl. 8-501.000.

SKF Compagnie d'Applications Mecaniques: *See—*
Bordes, Alain, 4,347,920, Cl. 192-41.00A.
Bordes, Alain, 4,347,921, Cl. 192-41.00A.

Skinner, Charles E.: *See—*
Alanko, Allan M.; Marko, Ollie W.; Skinner, Charles E.; and Wood, Larry H., 4,348,532, Cl. 556-457.000.

Skogerson, Lawrence E., to Universal Foods Corporation. Method for the production of chromium yeast. 4,348,483, Cl. 435-255.000.

Slater Electric Inc.: *See—*
Bowden, Wade R., Jr., 4,348,547, Cl. 174-65.00R.

Sleep Safe, Limited: *See—*
Fontaine, William G.; and Reeder, Willes W., 4,348,662, Cl. 340-562.000.

Slurry Mining Engineering Inc.: *See—*
Coakley, John E.; and Nolan, James J., 4,348,058, Cl. 299-17.000.

Smith, Bob G.: *See—*
Christiansen, David W.; and Smith, Bob G., 4,348,353, Cl. 376-364.000.

Smith, Frank G. Rapid advance long dwell feed mechanism for multiple slide machines. 4,347,961, Cl. 226-158.000.

Smith, George E.; and Strain, Robert J., to Bell Telephone Laboratories, Incorporated. Method of fabricating polysilicon electrodes. 4,347,656, Cl. 29-591.000.

Smith, John R.; and Fischer, Gerhard O. J., to Quaker Oats Limited. Simulated food product and method of manufacture therefor. 4,348,418, Cl. 426-104.000.

Smith & Loveless, Inc.: *See—*
Wood, Marvin E., 4,348,158, Cl. 417-40.000.

Smith, Peter W.: *See—*
Shnitkin, Harold; and Smith, Peter W., 4,348,679, Cl. 343-768.000.

Smith, Roger A.: *See—*
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,348,310, Cl. 524-167.000.

Smith, Ronald V.: *See—*
Byham, Geoffrey M.; and Smith, Ronald V., 4,347,997, Cl. 244-17.190.

Smith, Steve. Power-pulse switching circuit. 4,348,598, Cl. 307-300.000.

Smith, Walter J., to Huck Manufacturing Company. Apparatus and system for setting fasteners. 4,347,728, Cl. 72-391.000.

Snavely, Earl S., Jr.; and Caldwell, Paul L., Jr., to Mobil Oil Corporation. Water treatment method to remove dissolved oxygen therefrom. 4,348,289, Cl. 210-749.000.

Snelling, Christopher, to Xerox Corporation. Control for xerographic system. 4,348,100, Cl. 355-14.00R.

Snoek, David J.: *See—*
Boschetti, Armando; and Snoek, David J., 4,348,664, Cl. 340-600.000.

Societe des Applications Biologiques du Laser a l'Environnement (SABLE) S.a.r.l.: *See—*
Moreaud, Henri; and Meric, Jean-Paul, 4,348,112, Cl. 356-338.000.

Societe Francaise d'Equipements pour la Navigation Aerienne: *See—*
Bonfils, Georges L. A., 4,348,113, Cl. 356-350.000.

Societe Industrielle Bertrand Faure: *See—*
Letournoux, Alain; and Raye, Christian, 4,348,050, Cl. 297-365.000.

Sogo, Yoshitaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission. 4,347,756, Cl. 74-467.000.

Sohda, Takashi: *See—*
Kawamatsu, Yutaka; Sohda, Takashi; and Imai, Yoshio, 4,348,403, Cl. 424-270.000.

Solarex Corporation: *See—*
Lindmayer, Joseph, 4,348,254, Cl. 156-647.000.

Sollenberger, Nelson R.: *See—*
Leland, Kenneth W.; and Sollenberger, Nelson R., 4,348,772, Cl. 455-260.000.

Sollman, Paul B.: *See—*
Garland, Robert B.; Pappo, Raphael; and Sollman, Paul B., 4,348,388, Cl. 424-180.000.

Soni, Inderjit S.: *See—*
Crompton, Charles E.; Kazi, Abdulla M. Z.; and Soni, Inderjit S., 4,348,301, Cl. 252-313.00R.

Sonix Limited: *See—*
Shimamura, Kouichi, 4,348,267, Cl. 204-206.000.

Sonoda, Takenori: *See—*
Tsuchiya, Yoshikazu; Tanaka, Masato; Sonoda, Takenori; Watanabe, Tetsu; Kanai, Chiaki; and Watanabe, Nobuhiko, 4,348,699, Cl. 360-32.000.

Sontek Industries, Inc.: *See—*
Bodai, Conrad A., 4,347,983, Cl. 239-466.000.

Sony Corporation: *See—*
Fujimori, Yasuhiro; and Yamamoto, Kaichi, 4,348,659, Cl. 340-347.0AD.
Tsuchiya, Yoshikazu; Tanaka, Masato; Sonoda, Takenori; Watanabe, Tetsu; Kanai, Chiaki; and Watanabe, Nobuhiko, 4,348,699, Cl. 360-32.000.

Soula, Gerard: *See—*
Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,348,311, Cl. 524-530.000.

Spak, Michael E.: *See—*
McAlister, Doyle V.; Gunter, Thomas G.; Spak, Michael E.; and Schriber, Gene A., 4,348,741, Cl. 364-900.000.

Spease, Arthur L.: *See—*
Bennett, William G.; and Spease, Arthur L., 4,348,348, Cl. 264-255.000.

Spence, Gavin G.: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,348,257, Cl. 162-162.000.

Sperry Corporation: *See—*
Mittal, Faquir C.; Arrison, Frank J.; and Schonfeld, Arnold, 4,348,705, Cl. 360-98.000.
O'Brien, Steven M., 4,348,742, Cl. 364-900.000.
Schonfeld, Arnold; Eibner, Jules A.; and Bastian, Franklin E., 4,348,101, Cl. 355-14.00R.

Spigarelli, Donald J., to Hybrid Technology Corporation. Method and apparatus for vapor conservation and control. 4,348,174, Cl. 432-1.000.

Spindle, Harvey E.: *See—*
Yeckley, Russell N.; and Spindle, Harvey E., 4,348,565, Cl. 200-82.00B.

Spire Corporation: *See—*
Little, Roger G., 4,348,546, Cl. 136-256.000.

Spiteri, Ernest. Method for making electrodynamic loudspeakers having a planar diaphragm of expanded polystyrene. 4,348,342, Cl. 264-28.000.

Spokane Crusher Mfg. Co.: *See—*
Warren, Kenneth D.; and Tenold, Gregory G., 4,347,988, Cl. 241-300.000.

Sprague Electric Company: *See—*
Gontowski, Walter S., Jr., 4,348,451, Cl. 428-203.000.

Square D Company: *See—*
Alter, William F.; DeBoer, Jonathan J.; and Shellenberger, Charles R., 4,347,926, Cl. 198-388.000.

Stack, Eugene V.: *See—*
Burnett, Edward L.; and Stack, Eugene V., 4,348,345, Cl. 264-127.000.

Stadler, Paul: *See—*
Fehr, Theodor; Stadler, Paul; and Stutz, Peter, 4,348,392, Cl. 424-246.000.
Stutz, Peter; Fehr, Theodor; and Stadler, Paul, 4,348,391, Cl. 424-246.000.

Stamicarbon, B.V.: *See—*
Bruls, Pierre G. M. B.; van Hinsberg, Johannes G.; van Hardeveld, Rudolf; and Moreau, Dominique J. J. S. M., 4,348,520, Cl. 544-201.000.

Stanadyne, Inc.: *See—*
Wysong, Bryan M., 4,347,818, Cl. 123-369.000.

Standadyne, Inc.: *See—*
Gilbert, Wesley B., 4,348,163, Cl. 417-462.000.
Standard Oil Company (Indiana): *See—*
Keske, Robert G.; and Stephens, James R., 4,348,513, Cl. 528-188.000.
Stankosky, Michael J.: *See—*
Dufour, Charles H.; Gelinas, W. Robert; Stankosky, Michael J.; and Washchynsky, Bohdan D., 4,347,788, Cl. 101-415.100.
Stanley, Philip E.: *See—*
Cushing, David E.; and Stanley, Philip E., 4,348,724, Cl. 364-200.000.
Woods, William E.; Cushing, David E.; and Stanley, Philip E., 4,348,723, Cl. 364-200.000.
Stannow, Jorgen C.: *See—*
Tankred, Hans J.; Madsen, Per J.; and Stannow, Jorgen C., 4,348,607, Cl. 310-217.000.
Stansbury, Benjamin H.: *See—*
Bertagna, Richard A.; Stansbury, Benjamin H.; and Tarlow, Kenneth A., 4,347,911, Cl. 181-130.000.
Stansbury, Buddy F.: *See—*
Brereton, David A.; and Stansbury, Buddy F., 4,348,721, Cl. 364-200.000.
Star Seimitsu Kabushiki Kaisha: *See—*
Maeda, Katsumi, 4,347,919, Cl. 192-33.00R.
Starks Associates, Inc.: *See—*
Schultz, Robert J.; and Starks, Fred W., 4,348,522, Cl. 544-358.000.
Starks, Fred W.: *See—*
Schultz, Robert J.; and Starks, Fred W., 4,348,522, Cl. 544-358.000.
Staudenrausch, Georg, to Albert Handtmann GmbH & Co. Method and apparatus for sequential portioning of a plastically deformable mass, in particular sausage stuffing. 4,347,646, Cl. 17-49.000.
Stauffer Chemical Company: *See—*
Shim, Kyung S., 4,348,291, Cl. 252-49.900.
Wong, Rayman Y., 4,348,400, Cl. 424-263.000.
Steffan, Guido: *See—*
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Behre, Horst; Kienitz, Lutz; Schenk, Wolfgang; Steffan, Guido; and Vogel, Axel, 4,348,334, Cl. 260-505.00C.
Stegmann, Horst; Meyl, Wolfgang; and Hentschel, Peter, to Jenoptik Jena GmbH. Measuring equipment for the determination of terrestrial refraction. 4,347,739, Cl. 73-170.00R.
Stehman, Harold E.: *See—*
Daniels, Herbert E.; Stehman, Harold E.; and Moran, Brian P., 4,348,590, Cl. 378-112.000.
Steigerwald Strahltechnik GmbH: *See—*
Anderl, Peter; and Monch, Clauspeter, 4,348,576, Cl. 219-121.0EW.
Stembridge, William F.: *See—*
Gosline, Scott P.; Stembridge, William F.; and Sturrock, James C., 4,347,854, Cl. 128-736.000.
Stempeck, John W.: *See—*
Ellin, Seymour; and Stempeck, John W., 4,348,087, Cl. 354-139.000.
Stendel, Wilhelm: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,348,394, Cl. 424-248.570.
Stepan Chemical Company: *See—*
Lohr, Joseph E., Jr., 4,347,742, Cl. 73-432.0SD.
Stephens, James R.: *See—*
Keske, Robert G.; and Stephens, James R., 4,348,513, Cl. 528-188.000.
Stevens, David B. Bobsled. 4,348,033, Cl. 280-16.000.
Stievenart, Emile F.; Plessers, Hendrik S.; and Hellemans, Julianus J., to Agfa-Gevaert N.V. Method and device for separating a sheet from a stack of sheets. 4,348,019, Cl. 271-10.000.
Stock, Albert M.; and Tse, Wilson S., to Du Pont de Nemours, E. I., and Company. Refining tetrahydrofuran. 4,348,262, Cl. 203-37.000.
Stoepel, Kurt: *See—*
Franckowiak, Gerhard; Meyer, Horst; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,348,395, Cl. 424-250.000.
Stoeva, Nelly S.: *See—*
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,348,481, Cl. 435-234.000.
Stone & Webster Engineering Corp.: *See—*
Gartside, Robert J.; and Woebcke, Herman N., 4,348,364, Cl. 422-214.000.
Storchenmuhle Kinderausstattungs-GmbH & Co., Textile & Hartwarenwerk KG: *See—*
Thevenot, Gilles, 4,348,048, Cl. 297-250.000.
Storm, Gregory A.: *See—*
Storm, Nelson; and Storm, Gregory A., 4,348,716, Cl. 362-188.000.
Storm, Nelson; and Storm, Gregory A. Flashlight gun mount. 4,348,716, Cl. 362-188.000.
Stout, Tommy R.: *See—*
Grass, Kenneth G.; and Stout, Tommy R., 4,347,776, Cl. 84-383.00R.
Strain, Robert J.: *See—*
Smith, George E.; and Strain, Robert J., 4,347,656, Cl. 29-591.000.
Strassle, Alex, to Intercollection Development SA. Foam padded chair with screw assembly of seat, backrest and legs. 4,348,053, Cl. 297-445.000.
Straus, Albert E., to Hoover Universal, Inc. Ballcock assembly. 4,347,866, Cl. 137-436.000.
Strobel, Richard A.; and Lyons, Michael D., to American Standard Inc. Hydraulic valve position control system for regulating smokestack exhaust pressure. 4,347,869, Cl. 137-488.000.
Strom, Robert M., to Dow Chemical Company, The. Process for the selective aliphatic chlorination of alkylbenzenes. 4,348,265, Cl. 204-158.0HA.
Struck, Carl-Heinz; and Schumacher, Ralf, to Dr. C. Otto & Comp. G.m.b.H. Spray nozzle for coke oven gas-collecting system. 4,348,258, Cl. 202-255.000.
Struthers, Ralph C., to Universal Fuel Systems, Inc. Nitrogen metal fuel cell. 4,348,465, Cl. 429-27.000.
Studiengesellschaft Kohle m.b.H.: *See—*
Zosel, Kurt, 4,348,422, Cl. 426-475.000.
Sturrock, James C.: *See—*
Gosline, Scott P.; Stembridge, William F.; and Sturrock, James C., 4,347,854, Cl. 128-736.000.
Stutz, Peter; Fehr, Theodor; and Stadler, Paul, to Sandoz Ltd. Sulfonamido and sulfamoylamino-ergoline-I derivatives. 4,348,391, Cl. 424-246.000.
Stutz, Peter: *See—*
Fehr, Theodor; Stadler, Paul; and Stutz, Peter, 4,348,392, Cl. 424-246.000.
Subbarao, Saligrama N.; and Huang, Ho-Chung, to RCA Corporation. Method for fabricating via holes in a semiconductor wafer. 4,348,253, Cl. 156-643.000.
Suda, Seiji: *See—*
Sasayama, Takao; and Suda, Seiji, 4,348,729, Cl. 364-431.120.
Sudo, Yoshiyuki: *See—*
Fujiwara, Toshimasa; and Sudo, Yoshiyuki, 4,348,125, Cl. 400-645.100.
Suemura, Kenichiro; and Osawa, Masami, to Nippon Steel Corporation. Enamelling steel sheet. 4,348,229, Cl. 75-124.000.
Suganami, Takuya: *See—*
Oishi, Norio; Shimazu, Toshinari; Suganami, Takuya; and Masuda, Takahiro, 4,348,029, Cl. 277-26.000.
Sugimoto, Osamu; and Akagawa, Masaki, to Kabushiki Kaisha Nippon Coinco. Malfunction indication device for a vending machine. 4,347,925, Cl. 194-1.00N.
Sugimoto, Osamu: *See—*
Hayashi, Yukichi; Sugimoto, Osamu; and Yokohda, Yutaka, 4,347,860, Cl. 133-1.00R.
Hayashi, Yukichi; Tamara, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,347,924, Cl. 194-1.00N.
Sugisawa, Ko: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; and Kimura, Takashi, 4,348,421, Cl. 426-394.000.
Sugitani, Hirosi: *See—*
Hirohata, Michio; and Sugitani, Hirosi, 4,348,094, Cl. 354-234.000.
Sugiyama, Kimikazu: *See—*
Takada, Yukihiro; Sugiyama, Kimikazu; and Imai, Mithuo, 4,347,787, Cl. 101-333.000.
Sugo, Yuko: *See—*
Saito, Masaaki; Kawamura, Yoshihisa; Sugo, Yuko; and Inoue, Mitsumasa, 4,347,816, Cl. 123-308.000.
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., to American Home Products Corporation. Anti-arrhythmic N-[3-alkylaminopropyl]-N'-phenylureas. 4,348,413, Cl. 424-322.000.
Sullivan, James J.; and Grey, Charles M. High speed sterile fluid transfer unit. 4,347,874, Cl. 141-1.000.
Sullivan, Thomas A.: *See—*
McBee, William C.; and Sullivan, Thomas A., 4,348,313, Cl. 524-788.000.
Sulzer Brothers Limited: *See—*
Knecht, Max, 4,348,352, Cl. 376-272.000.
Rees, Karl, 4,347,810, Cl. 122-6.00A.
Sumitomo Chemical Company, Limited: *See—*
Kojima, Shinichi; Koide, Ten; Ogino, Shigeo; Tsuchiya, Toshiro; and Kameno, Yoshito, 4,348,386, Cl. 424-177.000.
Sumitomo Electric Industries, Ltd.: *See—*
Kita, Yasuo, 4,347,917, Cl. 188-73.450.
Sumitomo, Hiroyuki; and Uehara, Haruo, to Hisaka Works, Ltd. Plate type heat exchanger. 4,347,897, Cl. 165-167.000.
Sun Electric Corporation: *See—*
Kreft, Keith A., 4,348,732, Cl. 364-571.000.
Sun Oil Company, Ltd.: *See—*
Morgan, George W., 4,348,059, Cl. 299-25.000.
Sunbeam Corporation: *See—*
Gale, George M.; James, David I.; and Meyer, John V. B., 4,348,584, Cl. 219-549.000.
Sunderland, Alec: *See—*
Eaton, Alan; Mitchell, William T.; and Sunderland, Alec, 4,348,005, Cl. 251-268.000.
Sundwiger Eisenhutte Maschinenfabrik Grah & Co.: *See—*
Uphues, Ewald, 4,347,962, Cl. 226-195.000.
Sung, Rodney L., to Texaco Inc. Novel process and product. 4,348,210, Cl. 44-56.000.
Sutherland, Joseph E., to International Standard Electric Corporation. Digital debouncing and storage apparatus for use in a telephone switching system. 4,348,758, Cl. 370-110.200.
Suzuki, Shigeru; Ohno, Yukihiro; Yanagawa, Nobuyuki; and Kawaishi, Yasunori, to Ricoh Co., Ltd. Guide apparatus for movable contact glass in electrophotographic copying machines. 4,348,106, Cl. 355-75.000.
Suzuki, Shunsuke: *See—*
Komatsu, Mikiya; Suzuki, Shunsuke; and Maruyama, Takasumi, 4,347,889, Cl. 164-250.100.
Suzuki Sogyo Kabushiki Kaisha: *See—*
Nakanishi, Motoyasu, 4,348,246, Cl. 156-73.100.

Suzuki, Suzuo; Nakagawa, Yasuhiko; Aihara, Hisamoto; and Matsumoto, Yasuo, to Nissan Motor Co., Ltd. Fuel injection apparatus for an internal combustion engine. 4,347,825, Cl. 123-537.000.

Suzuki, Toyotosi; and Ago, Nobuhiro, to Canon Kabushiki Kaisha. Strap mounting device. 4,348,095, Cl. 354-288.000.

Suzuki, Yoshiro: *See*—
Kawazu, Hideyuki; and Suzuki, Yoshiro, 4,348,103, Cl. 355-15.000.

Svala, Carl G., to International Telephone and Telegraph Corporation. PCM Codec using common D/A converter for encoding and decoding. 4,348,768, Cl. 375-26.000.

Svetlik, Joseph F., to Phillips Petroleum Company. Display soles for articles of footwear. 4,347,673, Cl. 36-32.00R.

Swan, George A., to Exxon Research & Engineering Co. Catalytic reforming process. 4,348,271, Cl. 208-89.000.

Sweat, Robert H., Jr.; and Thornhill, William J., to International Business Machines Corporation. Impact printer hammer flight time and velocity sensing means. 4,347,786, Cl. 101-93.030.

Swensson, Torsten F.: *See*—
von Knorring, Enar S.; and Swensson, Torsten F., 4,347,885, Cl. 160-242.000.

Swithenbank, Joshua; and Taylor, David S., to Land Combustion Limited. Control of burners. 4,348,169, Cl. 431-89.000.

Swoboda, Josef: *See*—
Goertler, Horst; Hetzel, Friedrich; Prohaska, Hans; Rachner, Horst; Seitter, Wolf; and Swoboda, Josef, 4,348,655, Cl. 340-73.000.

Synek, Joseph, to Mobay Chemical Corporation. Flowable pesticides. 4,348,385, Cl. 424-173.000.

Szabo, Ted T.: *See*—
Robeson, Lloyd M.; and Szabo, Ted T., 4,348,500, Cl. 525-65.000.

Szczepanski, Henry; Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Rempfler, Hermann, to Ciba-Geigy Corporation. Herbicidal derivatives of pyrid-2-yloxyphenoxy-acetic acids and esters. 4,348,221, Cl. 71-94.000.

Tabler, Donald C.: *See*—
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 4,348,370, Cl. 423-362.000.

Taiyo Shokai Co., Ltd.: *See*—
Onishi, Masami, 4,347,950, Cl. 221-13.000.

Tajima, Masahiko: *See*—
Kobayashi, Akio; Kikuchi, Takehiro; Kondo, Toshio; and Tajima, Masahiko, 4,348,727, Cl. 364-431.060.
Sagisaka, Yasuo; Kondo, Toshio; and Tajima, Masahiko, 4,348,728, Cl. 364-431.060.

Takada, Yukihiro; Sugiyama, Kimikazu; and Imai, Mithuo, to Tokyo Electric Co., Ltd. Product name stamping device of label printers. 4,347,787, Cl. 101-333.000.

Takagi, Satoshi; and Watanabe, Toshio, to Clarion Co., Ltd. Magnetic tape recording/reproducing apparatus. 4,348,704, Cl. 360-96.500.

Takagi, Shoji: *See*—
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,348,363, Cl. 422-192.000.

Takahashi, Kaoru: *See*—
Horikoshi, Isamu; Sakuragawa, Nobuo; Ueno, Masaharu; and Takahashi, Kaoru, 4,348,384, Cl. 424-101.000.

Takahashi, Koichi; Higuchi, Megumu; and Watanabe, Minoru, to Nissan Motor Co., Ltd. Operating valve assembly for a power steering. 4,347,780, Cl. 91-375.00A.

Takahashi, Shuichi; Ogasawara, Fumihiro; and Ohta, Syuichi, to Ricoh Company, Limited. Facsimile apparatus. 4,348,697, Cl. 358-286.000.

Takahashi, Yukio, to Fujitsu Limited. System for driving bipolar ram. 4,348,747, Cl. 365-189.000.

Takahasi, Tosihiko: *See*—
Yoshinaga, Shoji; Kawano, Hirosige; Todo, Matsuzo; Takahasi, Tosihiko; Fujiwara, Kiyoshi; and Inoue, Yukio, 4,348,288, Cl. 210-708.000.

Takamatsu, Shunichi, to Itoki Co., Ltd. Article retrieval device. 4,348,152, Cl. 414-785.000.

Takanashi, Itsuo: *See*—
Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; and Yokokawa, Sumio, 4,348,617, Cl. 315-370.000.

Takasugi, Nobuhiro; and Kyomasu, Ryuichi, to Hitachi, Ltd. Wire bonding apparatus. 4,347,964, Cl. 228-4.500.

Takeda Chemical Industries, Ltd.: *See*—
Kawamatsu, Yutaka; Sohda, Takashi; and Imai, Yoshio, 4,348,403, Cl. 424-270.000.

Takemura, Hiroo; and Noda, Azusa, to Honda Giken Kogyo Kabushiki Kaisha. Two-wheeled motorcycle with pivotable seat arrangement. 4,347,909, Cl. 180-219.000.

Takeshita, Masajiro: *See*—
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,348,232, Cl. 75-238.000.

Takeuchi, Yasuhiro: *See*—
Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, 4,347,812, Cl. 123-90.550.

Takizawa, Masaaki: *See*—
Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, 4,347,812, Cl. 123-90.550.

Takizawa, Masayoshi: *See*—
Hayashi, Yukichi; Tamara, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,347,924, Cl. 194-1.00N.

Tamara, Masayuki: *See*—
Hayashi, Yukichi; Tamara, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,347,924, Cl. 194-1.00N.

Tams, Walter: *See*—
Bergholz, Helmut; and Tams, Walter, 4,348,140, Cl. 411-103.000.

Tan, Josef K. S. Heartbeat sensor holding device. 4,347,852, Cl. 128-687.000.

Tanaka, Kazuyuki; Ueki, Yoshiharu; Kunugi, Yoshiro; and Sakaguchi, Shozaburo, to Pioneer Electronic Corporation. Preset lighting device. 4,348,616, Cl. 315-314.000.

Tanaka, Kimio: *See*—
Ishida, Toshihiko; and Tanaka, Kimio, 4,347,933, Cl. 206-387.000.

Tanaka, Masato: *See*—
Tsuchiya, Yoshikazu; Tanaka, Masato; Sonoda, Takenori; Watanabe, Tetsu; Kanai, Chiaki; and Watanabe, Nobuhiko, 4,348,699, Cl. 360-32.000.

Tangonan, Gregory L.; Morrison, Robert J.; Wysocki, Joseph A.; and Persechini, David L., to Hughes Aircraft Company. Fiber optic transducer for measuring current or magnetic field. 4,348,587, Cl. 250-227.000.

Taniguchi, Yoshio: *See*—
Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,348,461, Cl. 428-409.000.

Tankred, Hans J.; Madsen, Per J.; and Stannow, Jorgen C., to Danfoss A/S. Electric motor, particularly motor-compressor. 4,348,607, Cl. 310-217.000.

Taraborrelli, Orlando, to Ford Aerospace and Communications Corporation. Device for preventing tape windup on the capstan of a tape deck. 4,348,702, Cl. 360-71.000.

Tarlow, Kenneth A.: *See*—
Bertagna, Richard A.; Stansbury, Benjamin H.; and Tarlow, Kenneth A., 4,347,911, Cl. 181-130.000.

Tateishi, Kazushi; Anzai, Kuniaki; and Tomita, Taketoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic testing apparatus for automatically testing a printed circuit board. 4,348,276, Cl. 209-573.000.

Tawse, Ian S., to Co-Gen, Inc. Power system. 4,347,702, Cl. 60-618.000.

Taylor, David S.: *See*—
Swithenbank, Joshua; and Taylor, David S., 4,348,169, Cl. 431-89.000.

TDK Electronics Co., Ltd.: *See*—
Ishida, Toshihiko; and Tanaka, Kimio, 4,347,933, Cl. 206-387.000.
Tokuoka, Yasumichi; and Kobuke, Takayoshi, 4,348,430, Cl. 427-215.000.

TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Kittel, Ludwig, 4,348,769, Cl. 375-28.000.

Tecnol, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,347,848, Cl. 128-402.000.

Tecumseh Products Company: *See*—
Dalton, Richard L., Jr., 4,347,659, Cl. 29-605.000.

Teijin Limited: *See*—
Imanaka, Yoshihiko; Saito, Yoichi; and Horike, Akihiro, 4,348,456, Cl. 428-336.000.
Mitsuishi, Yukio; Shiozaki, Shigeru; Chujo, Takao; and Yokoyama, Takeyuki, 4,348,446, Cl. 428-148.000.

Teikoku Chemical Industry Co., Ltd.: *See*—
Muramatsu, Mutsumi; Satoh, Toshio; Yanagimoto, Yukio; Shinuchi, Tadami; Nakajima, Toshio; and Nakajima, Isao, 4,348,410, Cl. 424-309.000.

Tele-Drill, Inc.: *See*—
Givler, Gregory C., 4,348,672, Cl. 340-854.000.

Teleflex Incorporated: *See*—
Bennett, William G.; and Spease, Arthur L., 4,348,348, Cl. 264-255.000.

Tenneco Chemicals, Inc.: *See*—
Kheidr, Mahmoud; and Fraser, Irene A. E., 4,348,494, Cl. 524-114.000.

Tennyson, W. Richard, to General Electric Company. Constant phase limiter. 4,348,643, Cl. 330-294.000.

Tenold, Gregory G.: *See*—
Warren, Kenneth D.; and Tenold, Gregory G., 4,347,988, Cl. 241-300.000.

Terada, Masao, to Shimano Industrial Company Limited. Multi-speed sprocket assembly for a bicycle. 4,348,200, Cl. 474-160.000.

Terakura, Yukio: *See*—
Sakakibara, Shiro; Tsukamoto, Kazumasa; Sakai, Takahiro; and Terakura, Yukio, 4,347,763, Cl. 74-789.000.

Teramachi, Hiroshi. Linear ball bearing unit. 4,348,064, Cl. 308-6.00C.

Terao, Motoyasu; Taniguchi, Yoshio; Horigome, Shinkichi; Ojima, Masahiro; Shigematsu, Kazuo; Kato, Keizo; Miyamura, Yoshinori; and Yonezawa, Seiji, to Hitachi, Ltd. Recording member. 4,348,461, Cl. 428-409.000.

Tersteeg, Glenn E.; and DiFulvio, Anthony P., to Eastman Kodak Company. Potentiometric metering apparatus. 4,347,750, Cl. 73-864.310.

Teshima, Minoru: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; Kodama, Tadasi; and Ohara, Wataru, 4,348,120, Cl. 400-124.000.

Texaco Inc.: *See*—
Nussbaum, Theodore W., 4,348,671, Cl. 340-853.000.
Sung, Rodney L., 4,348,210, Cl. 44-56.000.
Zimmerman, Robert L.; and McEntire, Edward E., 4,348,488, Cl. 521-115.000.

Texas Instruments Incorporated: *See—*
Budek, Jerzy A., 4,348,582, Cl. 219-483.000.
Harrison, Herman W., 4,348,733, Cl. 364-709.000.

Tezuka, Nobuo: *See—*
Hirohata, Michio; and Tezuka, Nobuo, 4,348,092, Cl. 354-230.000.
Yamamichi, Masayoshi; and Tezuka, Nobuo, 4,348,088, Cl. 354-152.000.

Thermo Electron Corporation: *See—*
Oettinger, Peter E., 4,348,765, Cl. 372-78.000.

Thevenot, Gilles, to Storchenmuhle Kinderausstattungs-GmbH & Co., Textile & Hartwarenwerk KG. Adjustable curved seat for infants. 4,348,048, Cl. 297-250.000.

Thiel, Max: *See—*
Friebe, Walter-Gunar; Kampe, Wolfgang; Thiel, Max; Schaumann, Wolfgang; and Wilhelms, Otto-Henning, 4,348,401, Cl. 424-267.000.

Thiele, Gerd: *See—*
Bube, Carsten; Thiele, Gerd; and Zeller, Hans, 4,348,583, Cl. 219-497.000.

Thiokol Corporation: *See—*
Law, Bliss W.; Kirchoff, George F.; and Adams, Gary V., 4,348,037, Cl. 280-733.000.

Thode, Herbert W., to General Dynamics Corp. Totally enclosed air cooled electrical machines. 4,348,604, Cl. 310-62.000.

Thomas & Betts Corporation: *See—*
Grundfest, Michael A., 4,348,548, Cl. 174-88.00R.
Gudaitis, Bernard V.; and Maximoff, Paul, 4,348,072, Cl. 339-97.00R.

Thomas, David T., to Raytheon Company. Antenna with a curved lens and feed probes spaced on a curved surface. 4,348,678, Cl. 343-754.000.

Thomas, Heinz: *See—*
Blahak, Johannes; Hubner, Hans; Koster, Johannes; Meiners, Hans J.; and Thomas, Heinz, 4,348,536, Cl. 560-169.000.

Thompson, John S.; and Jadlocki, Joseph F., Jr., to FMC Corporation. Method for inhibiting the growth of *Clostridium botulinum* and the formation of enterotoxin in comminuted meat products and products thereof. 4,348,419, Cl. 426-264.000.

Thompson, Kenneth P., to Champion International Corporation. Polyester film extrusion with edge bead control. 4,348,346, Cl. 264-146.000.

Thompson, Richard L., to General Electric Company. Luminaire lowering device with centering means. 4,348,717, Cl. 362-403.000.

Thorell, Lars G.: *See—*
Blomback, E. G. Birger; and Thorell, Lars G., 4,348,315, Cl. 260-112.00B.

Thornhill, William J.: *See—*
Sweat, Robert H., Jr.; and Thornhill, William J., 4,347,786, Cl. 101-93.030.

Thuvander, Arne: *See—*
Hillerstrom, Bjorn; Fransson, Lennarth; and Thuvander, Arne, 4,347,972, Cl. 236-18.000.

Thyssengas GmbH: *See—*
Friedrichs, Gregor, 4,347,672, Cl. 34-57.00R.

Tietjens, Eduard W., to U.S. Philips Corporation. Shaving apparatus. 4,347,662, Cl. 30-34.200.

Tikhonov, Jury P.; Alekhin, Stanislav A.; Bakhir, Vitold M.; and Zadorozhny, Jury G. Apparatus for cleaning drilling mud. 4,348,279, Cl. 210-96.100.

Till, Maxwell J.: *See—*
Wickham, Ian W.; Till, Maxwell J.; and Forster, Ernst, 4,347,881, Cl. 144-194.000.

Tilley, Jefferson W.: *See—*
Kierstead, Richard W.; and Tilley, Jefferson W., 4,348,396, Cl. 424-251.000.

Tinker, Richard E.: *See—*
Geil, Ronald J.; Tinker, Richard E.; and Carmo, Robert A., 4,347,758, Cl. 74-531.000.

Tinsley, Timothy M.: *See—*
Benton, Ronald; Kidder, Kenneth B.; Linderberg, Robert L.; Tinsley, Timothy M.; and Westley, Curtis E., 4,347,712, Cl. 62-175.000.

Tischler, Josef: *See—*
Becker, Herbert; and Tischler, Josef, 4,347,755, Cl. 74-421.00A.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,348,507, Cl. 526-125.000.

Toda, Tadahide: *See—*
Kosuda, Tooru; Ohashi, Michihiro; Takeuchi, Yasuhiro; Toda, Tadahide; Matsubara, Noboru; and Takizawa, Masaaki, 4,347,812, Cl. 123-90.550.

Todo, Matsuzo: *See—*
Yoshinaga, Shoji; Kawano, Hirosige; Todo, Matsuzo; Takahasi, Tosihiko; Fujiwara, Kiyoshi; and Inoue, Yukio, 4,348,288, Cl. 210-708.000.

Todorov, Ivan O.: *See—*
Popov, Mitko S.; Djedjeva, Galina M.; Todorov, Ivan O.; and Stoeva, Nelly S., 4,348,481, Cl. 435-234.000.

Tokuoka, Yasumichi; and Kobuke, Takayoshi, to TDK Electronics Company, Ltd. Process for producing magnetic particles for magnetic recording medium. 4,348,430, Cl. 427-215.000.

Tokushu Aerosol Co. Ltd.: *See—*
Seki, Michinori, 4,347,980, Cl. 239-289.000.

Tokuyama, Mistru: *See—*
Ohki, Kenji; Tokuyama, Mistru; Sagae, Masayuki; and Kawabuchi, Kenji, 4,347,844, Cl. 128-287.000.

Tokyo Electric Co., Ltd.: *See—*
Eddens, Fletcher C.; Moore, Robert S.; and Munkittrick, Kenneth R., 4,347,701, Cl. 60-413.000.
Takada, Yukihiro; Sugiyama, Kimikazu; and Imai, Mithuo, 4,347,787, Cl. 101-333.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hibino, Sadayoshi, 4,348,606, Cl. 310-184.000.
Tateishi, Kazushi; Anzai, Kuniaki; and Tomita, Taketoshi, 4,348,276, Cl. 209-573.000.

Tolnay, Janos: *See—*
Benyo, Janos; Papp, Tibor; and Tolnay, Janos, 4,347,841, Cl. 128-156.000.

Tom, Nelson N., to Ford Aerospace & Communications Corporation. Automatic phase alignment system for a tracking antenna. 4,348,676, Cl. 343-114.000.

Tomita, Masahiro: *See—*
Aoki, Mamoru; Tomita, Masahiro; Utsunomiya, Kei; Sako, Hironobu; Kaneko, Dentaro; Shimazaki, Katsunori; and Ishii, Yoshitomo, 4,348,226, Cl. 75-35.000.

Tomita, Taketoshi: *See—*
Tateishi, Kazushi; Anzai, Kuniaki; and Tomita, Taketoshi, 4,348,276, Cl. 209-573.000.

Tooley, Robert W., to Reliance Electric Company. Bearing seal. 4,348,067, Cl. 308-187.100.

Torok, Vilmos, to ASEA Aktiebolag. Electrical reluctance machine. 4,348,605, Cl. 310-168.000.

Towart, Robertson: *See—*
Franckowiak, Gerhard; Meyer, Horst; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,348,395, Cl. 424-250.000.

Townsend, Lawrence B., to Magnetrol International, Incorporated. Capacitive level sensing device. 4,347,740, Cl. 73-304.00C.

Townsend, Richard L., Jr.: *See—*
Blahut, Donald E.; Huang, Victor K.; and Townsend, Richard L., Jr., 4,348,720, Cl. 364-200.000.

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Tu, Hosheng, to UOP, Inc. Hydrogen utilization in fluid catalytic cracking. 4,348,272, Cl. 208-111.000.

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with a fluoropolymer and an ester polymer blend. 4,348,312, Cl. 428-144.000.
Tuson, Samuel; and Ghilardi, Jean-Pierre, to Entreprise d'Equipements Mecaniques et Hydrauliques EMH. Pivotal connection for articulated column of sea-bed working structure. 4,348,137, Cl. 405-202.000.
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Ulimo, Andre A. Safety razor having movable head. 4,347,663, Cl. 30-47.000.
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Upton, John D. Thermoformed closure of composite material. 4,347,939, Cl. 215-252.000.
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von Knorring, Enar S.; and Swensson, Torsten F. Roller blind structure. 4,347,885, Cl. 160-242.000.
von Knorring, Enar S. Roller blinds. 4,347,886, Cl. 160-242.000.
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Vostrovsky, Ernst, to Krauss-Maffei Aktiengesellschaft. Assembly for clamping mold to platens of injection-molding machine. 4,348,165, Cl. 425-185.000.
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Walker, Starnes E.; and Klein, Fred T., to Phillips Petroleum Company. Chromatographic analyzer detector and method. 4,348,115, Cl. 356-436.000.
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Wear, Frederick C.; Durant, Dick Q.; and McKinney, Howard F., to McDonnell Douglas Corporation. Apparatus and process for drying granular products. 4,347,670, Cl. 34-1.000.
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Weissman, Bernard, to IPCO Corporation. Dental post provided with a restorative material retainer. 4,348,183, Cl. 433-221.000.

Welt, David I., to Welt/Safe-Lock, Inc. Collapsible carts and supports for cameras and their equipment. 4,348,034, Cl. 280-35.000.

Welt/Safe-Lock, Inc.: *See—*
Welt, David I., 4,348,034, Cl. 280-35.000.

Werner, Arnold; Ennen, Peter; Nuebauer, Josef; Flaig, Hans; and Allgaier, Juergen, to D I E H L, Firma. Electro-mechanical pulse generator. 4,348,753, Cl. 368-188.000.

Werner, Franz: *See—*
Maly, Heinrich; and Werner, Franz, 4,348,707, Cl. 360-132.000.

Wernicke, Ubbo; and Meckl, Heinz, to Agfa-Gevaert Aktiengesellschaft AG. Process for the production of photographic images. 4,348,475, Cl. 430-399.000.

Western Electric Company, Inc.: *See—*
Draper, Clifton W.; and Sharma, Satya P., 4,348,263, Cl. 204-29.000.

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Cooper, Frank W., Jr.; and Gastner, Raymond P., 4,347,652, Cl. 29-407.000.
Gamble, James R.; Herrold, Lear C.; and Baran, Rowland S., 4,348,176, Cl. 432-258.000.
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Gyugyi, Laszlo; and Wood, Peter, 4,348,631, Cl. 323-211.000.
Hruda, Robert M., 4,348,567, Cl. 200-144.00B.
Morton, Edward W., 4,348,612, Cl. 315-58.000.
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Westland Aircraft Limited: *See—*
Byham, Geoffrey M.; and Smith, Ronald V., 4,347,997, Cl. 244-17.190.

Westley, Curtis E.: *See—*
Benton, Ronald; Kidder, Kenneth B.; Linderberg, Robert L.; Tinsley, Timothy M.; and Westley, Curtis E., 4,347,712, Cl. 62-175.000.

Wettach, Richard H.: *See—*
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Weuster, Udo: *See—*
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Weyerhaeuser Company: *See—*
Kost, William E.; and Schoenberger, Norman, Jr., 4,347,969, Cl. 229-34.0HW.

WGM Safety Corp.: *See—*
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Whirlpool Corporation: *See—*
Clearman, Jack F.; and Gurubatham, Vincent P., 4,347,861, Cl. 134-104.000.

White Chemical Corporation: *See—*
Mischutin, Vladimir, 4,348,306, Cl. 252-608.000.

White, Edward A. Method and portable apparatus for comparison of stored sets of data. 4,348,740, Cl. 364-900.000.

White, Edward A. Method and portable apparatus for comparison of stored sets of data. 4,348,744, Cl. 364-900.000.

Whitney, Joel G., to Du Pont de Nemours, E. I., and Company. Antiinflammatory 4,5-diaryl-α-polyfluoroalkyl-1H-imidazole-2-methanamines. 4,348,404, Cl. 424-273.00R.

Whittaker Corporation: *See—*
Fandel, Joseph N., 4,348,043, Cl. 294-83.00R.

Wick, Arnold, to Ciba-Geigy Corporation. Process for coloring organic material of high molecular weight. 4,348,239, Cl. 106-193.00D.

Wickham, Ian W.; Till, Maxwell J.; and Forster, Ernst, to Wickham, Ian Wallace. Wood splitting apparatus. 4,347,881, Cl. 144-194.000.

Wickham, Ian Wallace: *See—*
Wickham, Ian W.; Till, Maxwell J.; and Forster, Ernst, 4,347,881, Cl. 144-194.000.

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Nickolson, Robert; Kerb, Ulrich; Wiechert, Rudolf; Alig, Leo; Furst, Andor; and Muller, Marcel, 4,348,327, Cl. 260-397.100.

Wilding, Edwin; and DeVere, James W., to Griffin & Company, Inc. Dumper apparatus and methods. 4,348,148, Cl. 414-421.000.

Wilhelm Hegenscheidt Gesellschaft mbH: *See—*
Dombrowski, Theodor; and Luzina, Max, 4,347,769, Cl. 82-8.000.

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Williams, Glenn L.; Brown, A. Dix; and Reilly, Edward J., to Gould Inc. Automatic line segment generator for use with linear array display devices. 4,348,667, Cl. 340-753.000.

Williamson, Kenneth T., Jr.; Bruce, Samuel S., Jr.; and Martin, Walter L., Jr., to PPG Industries, Inc. Method of controlling filament formation in a glass fiber bushing. 4,348,217, Cl. 65-2.000.

Wills, Neville D.; and Kwiatkowski, Sigmund, to Half Court Tennis Pty. Limited. Racquet. 4,348,025, Cl. 273-73.00R.

Wilpon, Jay G.: *See—*
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Wilson, David A.: *See—*
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Wind Engineering Corporation: *See—*
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Woebcke, Herman N.: *See—*
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Wolfson, Lennard J.: *See—*
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Woltman, John; Zarfos, Donald W.; and Bulger, Robert F., deceased (by Bulger, Mary L., executrix), to United States Tobacco Company. Method and apparatus for removing cigar wrappers from the web of a bobbin. 4,347,856, Cl. 131-105.000.

Wong, Lungchuck, to F. Jos. Lamb Company. Gravity chuting conveyor. 4,347,923, Cl. 193-35.00S.

Wong, Rayman Y., to Stauffer Chemical Company. Pyridylpropyl alkyl-substituted benzoates and their use as insect repellents. 4,348,400, Cl. 424-263.000.

Wood, Arthur D., to Canadian Patents & Development Limited. Finstabilized container of foldable sheet material. 4,347,686, Cl. 47-73.000.

Wood, Arthur D., to Canadian Patents & Development Limited. Aerial dispensing apparatus. 4,347,951, Cl. 221-86.000.

Wood, David B., III, to Cincinnati Milacron Inc. Article gripping apparatus. 4,348,044, Cl. 294-88.000.

Wood, Donald C. Apparatus for cutting glass. 4,347,958, Cl. 225-96.500.

Wood, Larry H.: *See—*
Alanko, Allan M.; Marko, Ollie W.; Skinner, Charles E.; and Wood, Larry H., 4,348,532, Cl. 556-457.000.

Wood, Marvin E., to Smith & Loveless, Inc. Sewage pumping station. 4,348,158, Cl. 417-40.000.

Wood, Peter: *See—*
Gyugyi, Laszlo; and Wood, Peter, 4,348,631, Cl. 323-211.000.

Woodrow, Peter A.: *See—*
El-Menshawy, Mohamed F.; Woodrow, Peter A.; and Bhattacharyya, Sushantha K., 4,348,573, Cl. 219-69.00M.

Woods, Eugene L., to General Dynamics Corporation. Method and structure for compensating for variations in vapor cooled lead resistance of superconducting magnets. 4,348,710, Cl. 361-141.000.

Woods, William E.; Cushing, David E.; and Stanley, Philip E., to Honeywell Information Systems Inc. Control store test selection logic for a data processing system. 4,348,723, Cl. 364-200.000.

Woodworth, Archie G.: *See—*
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,348,209, Cl. 23-232.00R.

World Resources Company: *See—*
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Worley, Arthur C., to Exxon Research & Engineering Co. Fabricated gate valves. 4,347,865, Cl. 137-375.000.

Worpenberg, Reinhard: *See—*
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Worth, Sidney V.; and Nelson, Keith D., to Continental-Wirt Electronics Corp. Frangible polarizing rib for multiple contact header. 4,348,073, Cl. 339-186.00M.

Wossner, Helmut: *See—*
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Wourms, Robert L.: *See—*
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Wright, David; and Hawkes, Ivor, to Joy Manufacturing Company. Detecting and measuring the position of a break in solid formations by measuring the capacitance of an enlongated element embedded therein. 4,348,635, Cl. 324-52.000.

Wright, Donald G., to Adelphi Research Center, Inc. Oil burner nozzle. 4,347,982, Cl. 239-405.000.

Wright, Michael L., to Chloride Silent Power Limited. Electrochemical cells containing liquid sodium as the anodic material. 4,348,467, Cl. 429-94.000.

Wright, Michael L., to Chloride Silent Power Limited. Beta alumina solid electrolyte material and its manufacture and electrochemical cells or other energy conversion devices containing such material. 4,348,468, Cl. 429-193.000.

Wu, M. T.; and Chai, Thomas Y., to Honeywell Inc. Demand defrost sensor. 4,347,709, Cl. 62-140.000.

Wueger, Karl W.: *See—*
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Wunderlich, Alan M. Utilizing gamma cameras for uptake studies and restricted fields of view and multiple aperture collimator systems therefor. 4,348,591, Cl. 250-505.100.

Wurfel, Peter: *See—*
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Wysocki, Joseph A.: *See—*
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Wysong, Bryan M., to Stanadyne, Inc. Externally controlled fuel delivery curve adjustment mechanism for a fuel injection pump. 4,347,818, Cl. 123-369.000.

Xerox Corporation: *See*—
Anderson, Harold M.; Marcum, Norman E.; and DuVall, Wilbur E., 4,348,624, Cl. 318-634.000.
Fantozzi, Louis J., 4,348,099, Cl. 355-14.00E.
Johnson, Richard V., 4,348,079, Cl. 350-358.000.
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Yagi, Akio: *See*—
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Yamada, Tsutomu: *See*—
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Yamamichi, Masayoshi; and Tezuka, Nobuo, to Canon Kabushiki Kaisha. Single lens reflex camera. 4,348,088, Cl. 354-152.000.

Yamamoto, Hachizou: *See*—
Nakatani, Hiroshi; Ishida, Masahide; and Yamamoto, Hachizou, 4,348,551, Cl. 179-1.0SM.

Yamamoto, Hideharu: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,348,751, Cl. 368-82.000.

Yamamoto, Kaichi: *See*—
Fujimori, Yasuhiro; and Yamamoto, Kaichi, 4,348,659, Cl. 340-347.0AD.

Yanagawa, Nobuyuki: *See*—
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Yanagida, Hiroyuki: *See*—
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Yanagimoto, Yukio: *See*—
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Yanagishima, Takayuki; and Seko, Yasutoshi, to Nissan Motor Company, Limited. Safety assurance system for road vehicles. 4,348,663, Cl. 340-576.000.

Yano, Shozo; Miyake, Toshiyuki; Fujinaga, Yasuhiro; Koomoto, Akira; Kawara, Toshio; Yagi, Akio; Tsuji, Tomohiro; and Nagaoka, Tadashi, to Shimadzu Corporation. Electronic reading balance. 4,347,903, Cl. 177-25.000.

Yasuda, Shigeo: *See*—
Matsuda, Akira; Hayakawa, Yoshihiro; Yasuda, Shigeo; and Iwasaki, Motoaki, 4,348,654, Cl. 340-58.000.

Yeckley, Russell N.; and Spindle, Harvey E., to Westinghouse Electric Corp. Interchangeable chemically operated circuit breaker. 4,348,565, Cl. 200-82.00B.

Yi, Alberto: *See*—
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Yoda, Makoto: *See*—
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Yokohama Kiko Co., Ltd.: *See*—
Ohno, Akira; Katayama, Hitomi; Nomura, Suguru; Senaha, Susumu; Kyo, Suizo; Shmomura, Susumu; Akagami, Akira; and Imai, Hiroshi, 4,348,463, Cl. 428-429.000.

Yokohda, Yutaka: *See*—
Hayashi, Yukichi; Sugimoto, Osamu; and Yokohda, Yutaka, 4,347,860, Cl. 133-1.00R.

Yokokawa, Sumio: *See*—
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York, Bernard H. Variable entropy solar energy harvester. 4,347,834, Cl. 126-424.000.

Yoshiike, Nobuyuki: *See*—
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Yoshinaga, Shoji; Kawano, Hirosige; Todo, Matsuzo; Takahasi, Tosihiko; Fujiwara, Kiyoshi; and Inoue, Yukio, to Hitachi, Ltd. Process for desalting fuel oil. 4,348,288, Cl. 210-708.000.

Yoshioka, Masahiro; and Koike, Toshifumi, to Hitachi, Ltd. Thrust bearing. 4,348,065, Cl. 308-9.000.

Young, Vernon V.; and Bright, David R., to International Minerals & Chemical Corp. Quinoxaline adducts useful as anthelmintics. 4,348,389, Cl. 424-228.000.

Youngclaus, William P., Jr., to Haljun, William R. Gum massage device. 4,347,839, Cl. 128-62.00A.

Yrjonen, Tapio; Pietila, Urpo; and Rawlins, Tim, to Wallac Oy. Method for compensating measuring values when measuring the radiation from a number of radioactive samples in an automatic radiation detecting instrument. 4,348,588, Cl. 250-252.100.

Yu, Kin C.: *See*—
Farrell, Robert J.; Coit, Kenneth T.; Vernon, John H.; Yu, Kin C.; Huettner, Robert E.; and Grandmaison, John P., 4,348,725, Cl. 364-300.000.

Yurasko, George, Jr.: *See*—
Kammer, Paul A.; Yurasko, George, Jr.; and Zmrzlik, Karel, 4,348,434, Cl. 427-423.000.

Zadorozhny, Jury G.: *See*—
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Zahid, Abduz, to Greer Hydraulics, Inc. Pressure accumulator with locking nut. 4,347,871, Cl. 138-30.000.

Zambrow, John L., to Borg-Warner Corporation. Heat exchanger with bilayered metal end container for anticorrosive addition. 4,347,895, Cl. 165-134.00R.

Zarfos, Donald W.: *See*—
Woltman, John; Zarfos, Donald W.; and Bulger, Robert F., deceased, 4,347,856, Cl. 131-105.000.

Zarur, George L., to World Resources Company. Yield of metal values from incinerated sludges. 4,348,228, Cl. 75-97.00R.

Zaschke, Horst; Wolff, Rudolf; Pelzl, Gerhard; and Demus, Dietrich, to VEB Werk fur Fernsehelektronik im Veb Kombinat Mikroelektronik. Nematic liquid crystal mixtures. 4,348,298, Cl. 252-299.100.

Zaschke, Horst: *See*—
Demus, Dietrich; Zaschke, Horst; Vorbrodt, Hans-Mathias; Kresse, Horst; and Weissflog, Wolfgang, 4,348,324, Cl. 549-369.000.

Zeller, Hans: *See*—
Bube, Carsten; Thiele, Gerd; and Zeller, Hans, 4,348,583, Cl. 219-497.000.

Zemelman, Valery B.; Kleiner, Fredric; and Kuchman, Michael J., to General Foods Corporation. Gasified ice product and process having improved storage stability. 4,347,707, Cl. 62-69.000.

Zenith Radio Corporation: *See*—
d'Hautecourt, Alain H., 4,348,695, Cl. 358-160.000.

Zimmerman, Edwin H. Gas generating system. 4,348,211, Cl. 48-76.000.

Zimmerman, Robert L.; and McEntire, Edward E., to Texaco Inc. Polyurethanes using novel N-substituted perhydrodioxazepines as catalysts. 4,348,488, Cl. 521-115.000.

Zmrzlik, Karel: *See*—
Kammer, Paul A.; Yurasko, George, Jr.; and Zmrzlik, Karel, 4,348,434, Cl. 427-423.000.

Zobel, Frederick A.; and Burke, Joseph D., to General Foods Corporation. Beverage bottling method. 4,347,695, Cl. 53-432.000.

Zoecon Corporation: *See*—
McDaniel, Joe D., Jr.; and Pruitt, Paul L., 4,348,321, Cl. 260-326.00E.

Zolnowsky, John E.: *See*—
Gunter, Thomas G.; Crudele, Lester M.; and Zolnowsky, John E., 4,348,722, Cl. 364-200.000.

Zook, Steven T., to Vaughn, Ronald F. Musician's pick. 4,347,773, Cl. 84-322.000.

Zory, Peter S.; Scholl, Frederick W.; and Lockwood, Harry F., to Optical Information Systems, Inc. Mounting arrangement for semiconductor optoelectronic devices. 4,347,655, Cl. 29-589.000.

Zosel, Kurt, to Studiengesellschaft Kohle m.b.H. Process for the direct decaffeination of aqueous coffee extract solutions. 4,348,422, Cl. 426-475.000.

Zweifel, Hans: *See*—
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,348,530, Cl. 549-27.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Advanced Decision Handling, Inc.: *See*—
Hall, Arthur D., III, Re. 31,023, Cl. 47-1.00R.

Hall, Arthur D., III, to Advanced Decision Handling, Inc. Highly automated agricultural production system. Re. 31,023, Cl. 47-1.00R.

Otto Zollinger, Inc.: *See*—
Zollinger, Otto, Re. 31,024, Cl. 242-152.100.

Santa Fe International Corporation: *See*—
Shatto, Harry H., Re. 31,026, Cl. 367-106.000.

Shatto, Harry H., to Santa Fe International Corporation. Navigation system for maneuvering a structure about a submerged object. Re. 31,026, Cl. 367-106.000.

Zollinger, Otto, to Otto Zollinger, Inc. Yarn tensioning device. Re. 31,024, Cl. 242-152.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Wittman, Erwin Johann, to RCA Corporation. Synchronous detector control. B1 3,651,418, Cl. 329-50.

RCA Corporation: *See*—
Wittman, Erwin Johann, B1 3,651,418, Cl. 329-50.

Griswold, Augusta W., to Xerox Corporation. Semi-automatic document handler. B1 3,888,582, Cl. 355-69.

Xerox Corporation: *See*—
Griswold, Augusta W., B1 3,888,582, Cl. 355-69.

Muranaka, Dwight M., to Y 2 Associates, Inc. Selective signal-responsive circuit. B1 3,187,234, Cl. 361-182.

Y 2 Associates, Inc.: *See*—
Muranaka, Dwight M., B1 3,187,234, Cl. 361-182.

LIST OF DESIGN PATENTEES

A. Ahlstrom Osakeyhtio: *See*—
Sarpaneva, Timo, 266,046, Cl. D7-15.000.

Acero, Steve A.; and Rougeau, Edward L. Ventilating hood for an electroplating tank. 266,108, 9-7-82, Cl. D23-151.000.

Ariga, Kazuo; and Yoshida, Mitunari, to Stanley Electric Co., Ltd. Electric discharge lamp. 266,110, 9-7-82, Cl. D26-3.000.

Arrington, Patricia M. Solar energy collector for mounting over windows of buildings for space heating thereof. 266,105, 9-7-82, Cl. D23-72.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,065, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,066, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,067, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,068, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,069, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,070, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,071, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,072, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,073, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,074, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,075, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,076, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,077, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,078, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,079, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,080, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,081, 9-7-82, Cl. D13-23.000.

Asanuma, Yoshihiko, to Showa Aluminum Kabushiki Kaisha. Heat releasing plate for mounting semiconductor components. 266,082, 9-7-82, Cl. D13-23.000.

Associated Mills, Inc.: *See*—
Grube, Clifford E., 266,102, Cl. D21-191.000.

Austin, Clyde A. Ring band. 266,062, 9-7-82, Cl. D11-26.000.

Auto Alloys R&D Ltd.: *See*—
Tutton, William G. G., 266,092, Cl. D15-126.000.

Becker, Werner, to Esselte Pendaflex Corporation. Portable apparatus for printing and dispensing labels. 266,096, 9-7-82, Cl. D18-19.000.

Bemiss, James M., to Ex-Cell-O Corporation. Armored vehicle. 266,063, 9-7-82, Cl. D12-12.000.

Beretta, Angelo V., to Durastone Company, Inc. Reflective pavement marker for roads. 266,060, 9-7-82, Cl. D10-113.000.

Berkheij, Johannes C., to Metaalwarenfabriek Hoogmerk B.V. Money chest. 266,114, 9-7-82, Cl. D99-34.000.

Best, Willie H. Grill assembly. 266,050, 9-7-82, Cl. D7-108.000.

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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Harrison, Cecil P. Granulation of urea phosphate from urea and merchant-grade phosphoric acid. T102,201, 9-7-82, Cl. 71-29.000.

CLASSIFICATION OF PATENTS

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303 R	4,347,845
328	4,347,846
334 R	4,347,847
402	4,347,848
419 P	4,347,849
660	4,347,850
668	4,347,851
687	4,347,852
725	4,347,853
736	4,347,854

CLASS 131

78	4,347,855
105	4,347,856
276	4,347,857
	4,347,858
290	4,347,859

CLASS 133

1 R	4,347,860

CLASS 134

104	4,347,861

CLASS 135

20 R	4,347,862

CLASS 136

244	4,348,545
256	4,348,546

CLASS 137

212	4,347,863
269	4,347,864
375	4,347,865
436	4,347,866
460	4,347,867
462	4,347,868
488	4,347,869
614.05	4,347,870

CLASS 138

30	4,347,871

CLASS 139

435	4,347,872

CLASS 140

71.5	4,347,873

CLASS 141

1	4,347,874
18	4,347,875
70	4,347,876
91	4,347,877
300	4,347,878
364	4,347,879

CLASS 144

2 Z	4,347,880
194	4,347,881
225	4,347,882

CLASS 145

61 R	4,347,883

CLASS 148

6.35	4,348,241

CLASS 149

7	4,348,242

CLASS 152

158	4,347,884

CLASS 156

71	4,348,243
72	4,348,244
73.1	4,348,245
	4,348,246
156	4,348,247
276	4,348,248
442.2	4,348,249
473	4,348,250
500	4,348,251
538	4,348,252
643	4,348,253
647	4,348,254
656	4,348,255

CLASS 160

242	4,347,885
	4,347,886
368 R	4,347,887

CLASS 162

49	4,348,256
162	4,348,257

CLASS 164

34	4,347,888
250.1	4,347,889
528	4,347,890

CLASS 165

1	4,347,891
10	4,347,892
44	4,347,893
76	4,347,894
134 R	4,347,895
166	4,347,896
167	4,347,897

CLASS 166

55	4,347,898
310	4,347,899
380	4,347,900

CLASS 169

62	4,347,901

CLASS 173

93.5	4,347,902

CLASS 174

65 R	4,348,547
88 R	4,348,548

CLASS 177

25	4,347,903
50	4,347,904
149	4,347,905

CLASS 179

1 E	4,348,549
	4,348,552
1 SB	4,348,553
1 SD	4,348,550
1 SM	4,348,551
18 B	4,348,554
90 D	4,348,555

CLASS 180

65 C	4,347,907
131	4,347,908
219	4,347,909
268	4,347,910

CLASS 181

130	4,347,911
286	4,347,912

CLASS 182

142	4,347,913
	4,347,914

CLASS 184

105 B	4,347,915

CLASS 187

95	4,347,916

CLASS 188

73.45	4,347,917

CLASS 192

0.02 R	4,347,918
33 R	4,347,919
41 A	4,347,920
	4,347,921

CLASS 193

23	4,347,922
35 S	4,347,923

CLASS 194

1 N	4,347,924

4,347,925

CLASS 198

388 4,347,926
434 4,347,927
690 4,347,928

CLASS 200

5 A 4,348,557
5 R 4,348,556
6 R 4,348,558
11 R 4,348,559
38 A 4,348,560
51 R 4,348,561
52 R 4,348,562
67 D 4,348,563
67 F 4,348,564
82 B 4,348,565
144 B 4,348,566
4,348,567
153 LB 4,348,568
155 R 4,348,569
191 4,348,570

CLASS 202

255 4,348,258

CLASS 203

1 4,348,259
9 4,348,260
25 4,348,261
37 4,348,262

CLASS 204

29 4,348,263
158 HA 4,348,265
158 R 4,348,264
159.17 4,348,266
206 4,348,267
290 R 4,348,268
299 R 4,348,269

CLASS 206

3 4,347,929
45.34 4,347,930
343 4,347,932
387 4,347,933
438 4,347,931
633 4,347,934

CLASS 208

9 4,348,270
89 4,348,271
111 4,348,272
113 4,348,273

CLASS 209

2 4,348,274
3.2 4,347,935
3.3 4,347,936
310 4,348,275
573 4,348,276
622 4,347,937
705 4,348,277

CLASS 210

86 4,348,278
96.1 4,348,279
101 4,348,280
129 4,348,281
242.3 4,348,282
321.3 4,348,283
486 4,348,284
602 4,348,285
658 4,348,286
705 4,348,287
708 4,348,288
749 4,348,289
783 4,348,290

CLASS 212

121 4,347,938

CLASS 215

252 4,347,939
253 4,347,940

CLASS 219

10.49 R 4,348,571
10.55 A 4,348,572
69 M 4,348,573
73.21 4,348,574
86.33 4,348,575
121 EW 4,348,576
121 PE 4,348,577
130.01 4,348,578
216 4,348,579
390 4,348,580
460 4,348,581
483 4,348,582
497 4,348,583
549 4,348,584

CLASS 220

6 4,347,941
89 A 4,347,942
306 4,347,943
320 4,347,944
327 4,347,945
375 4,347,946
378 4,347,947
404 4,347,948
415 4,347,949

CLASS 221

13 4,347,950
86 4,347,951
129 4,347,952

CLASS 222

207 4,347,953
484 4,347,954

CLASS 223

38 4,347,955

CLASS 224

202 4,347,956

CLASS 225

93 4,347,957
96.5 4,347,958
97 4,347,959

CLASS 226

4,347,960
158 4,347,961
195 4,347,962

CLASS 227

8 4,347,963

CLASS 228

4.5 4,347,964
107 4,347,965
173 F 4,347,966

CLASS 229

27 4,347,967
33 4,347,968
34 HW 4,347,969
39 R 4,347,970

CLASS 233

20 R 4,347,971

CLASS 235

92 CT 4,348,585

CLASS 236

18 4,347,972
34.5 4,347,973
46 R 4,347,974
59 4,347,975
68 B 4,347,976
92 B 4,347,977

CLASS 239

78 4,347,978
206 4,347,979
289 4,347,980
394 4,347,981
405 4,347,982
466 4,347,983
707 4,347,984

CLASS 241

1 4,347,985
74 4,347,986
300 4,347,988

CLASS 242

35.5 R 4,347,989
36 4,347,990
43.2 4,347,991
68.4 4,347,992
75.51 4,347,993
152.1 Re.31,024
203 4,347,994
204 4,347,995

CLASS 244

3.16 4,347,996
17.19 4,347,997

CLASS 248

68 R 4,347,998
73 4,347,999
231 4,348,000
243 4,348,001

CLASS 249

19 4,348,002
96 4,348,003
210 4,348,004

CLASS 250

214 R 4,348,586
227 4,348,587
252.1 4,348,588
387 4,348,589
505.1 4,348,591
560 4,348,592
578 4,348,593

CLASS 251

268 4,348,005
288 4,348,006

CLASS 252

49.9 4,348,291
90 4,348,292
4,348,293
142 4,348,294
184 4,348,295
4,348,296
4,348,297
299.1 4,348,298
301.4 S 4,348,299
309 4,348,300
313 R 4,348,301
389 R 4,348,302
447 4,348,303
455 Z 4,348,304
542 4,348,305
608 4,348,306

CLASS 254

106 4,348,007
122 4,348,008
131 4,348,010
134.3 R 4,348,009
350 4,348,011

CLASS 256

12 4,348,012

CLASS 260

112 B 4,348,315
112 R 4,348,316
112.5 R 4,348,317
153 4,348,318
208 4,348,319
239 A 4,348,320
326 E 4,348,321
397.1 4,348,327
397.2 4,348,328
403 4,348,329
456 NS 4,348,330
465 D 4,348,331
502.4 R 4,348,332
4,348,333
505 C 4,348,334
508 4,348,335
4,348,336
543 P 4,348,337

CLASS 261

142 4,348,338

CLASS 264

0.5 4,348,339
8 4,348,340
4,348,341
28 4,348,342
29.5 4,348,343
31 4,348,344
127 4,348,345
146 4,348,346
231 4,348,347
255 4,348,348
564 4,348,349
570 4,348,350

CLASS 266

220 4,348,013

CLASS 267

87 4,348,014
140.4 4,348,015
177 4,348,016

CLASS 269

296 4,348,017

CLASS 271

10 4,348,018
4,348,019
35 4,348,020
112 4,348,021

CLASS 273

1.5 R 4,348,022
29 A 4,348,023
73 A 4,348,024
73 R 4,348,025
126 R 4,348,026
241 4,348,027
249 4,348,028

CLASS 277

26 4,348,029
40 4,348,030
83 4,348,031
235 B 4,348,032

CLASS 280

16 4,348,033
35 4,348,034
478 R 4,348,035
615 4,348,036
733 4,348,037

CLASS 283

34 4,348,038

CLASS 285

1 4,348,039
175 4,348,040
286 4,348,041

CLASS 290

54 4,348,594

CLASS 293

120 4,348,042

CLASS 294

83 R 4,348,043
88 4,348,044

CLASS 296

14 4,348,045
184 4,348,047
201 4,348,046

CLASS 297

250 4,348,048
254 4,348,049
365 4,348,050
423 4,348,051
440 4,348,052
445 4,348,053

CLASS 298

11 4,348,054
23 DF 4,348,055

CLASS 299

4 4,348,056
12 4,348,057
17 4,348,058
25 4,348,059

CLASS 300

21 4,348,060

CLASS 301

37 R 4,348,061

CLASS 303

6 C 4,348,062

CLASS 307

221 R 4,348,595
264 4,348,596
269 4,348,597
300 4,348,598
426 4,348,599
475 4,348,600
530 4,348,601
4,348,602

CLASS 308

3.8 4,348,063
6 C 4,348,064
9 4,348,065
4,348,066
187.1 4,348,067

CLASS 310

50 4,348,603
62 4,348,604
168 4,348,605
184 4,348,606
217 4,348,607
242 4,348,608
367 4,348,609

CLASS 312

257 R 4,348,068
324 4,348,069

CLASS 313

386 4,348,610
388 4,348,611

CLASS 315

58 4,348,612
130 4,348,613
189 4,348,614
219 4,348,615
314 4,348,616
370 4,348,617

CLASS 318

38 4,348,618
139 4,348,619
154 4,348,620
254 4,348,621
318 4,348,622
568 4,348,623
634 4,348,624
757 4,348,625
772 4,348,626
807 4,348,627

CLASS 320

61 4,348,628

CLASS 322

99 4,348,629

CLASS 323

207 4,348,630
211 4,348,631
280 4,348,632
314 4,348,633
353 4,348,634

CLASS 324

52 4,348,635
73 R 4,348,636
77 B 4,348,637
127 4,348,638
329 4,348,639

CLASS 328

41 4,348,640

CLASS 329

50 B1 3,651,418
50 4,348,641

CLASS 330

149 4,348,642
294 4,348,643
297 4,348,644
306 4,348,645

CLASS 331

77 4,348,646
96 4,348,649

CLASS 333

195 4,348,650
262 4,348,651

CLASS 339

59 R 4,348,070
75 MP 4,348,071
97 R 4,348,072
186 M 4,348,073

CLASS 340

52 F 4,348,653
52 R 4,348,652
58 4,348,654
73 4,348,655
146.3 R 4,348,656
310 R 4,348,657
347 AD 4,348,658
4,348,659
365 VL 4,348,660
510 4,348,661
562 4,348,662
576 4,348,663
600 4,348,664
682 4,348,665
753 4,348,666
4,348,667
825.06 4,348,668
825.58 4,348,669
825.78 4,348,670
853 4,348,671
854 4,348,672
870.18 4,348,673

CLASS 343

5 SA 4,348,674
7 VM 4,348,675
114 4,348,676
729 4,348,677
754 4,348,678
768 4,348,679
778 4,348,680
854 4,348,681

CLASS 346

1.1 4,348,682
31 4,348,683
153.1 4,348,684
155 4,348,685

CLASS 350

3.71 4,348,080
96.11 4,348,074
96.13 4,348,075
96.22 4,348,076
357 4,348,077
4,348,078
358 4,348,079
412 4,348,081
423 4,348,082
453 4,348,083
454 4,348,084
458 4,348,085

CLASS 354

83 4,348,086
139 4,348,087
152 4,348,088
195 4,348,089
224 4,348,090
225 4,348,091
230 4,348,092
233 4,348,093
234 4,348,094
288 4,348,095
289 4,348,096
293 4,348,097

CLASS 355

3 TR 4,348,098
14 E 4,348,099
14 R 4,348,100
4,348,101
14 SH 4,348,102
15 4,348,103
41 4,348,104
67 4,348,105
69 B1 3,888,582
75 4,348,106

CLASS 356

72 4,348,107
125 4,348,108
252 4,348,109
328 4,348,110
336 4,348,111
338 4,348,112
350 4,348,113
431 4,348,114
436 4,348,115

CLASS 357

30 4,348,686
79 4,348,687

CLASS 358

29 4,348,688
31 4,348,689
44 4,348,690
114 4,348,691
127 4,348,692
140 4,348,693
158 4,348,694
160 4,348,695
188 4,348,696
286 4,348,697

CLASS 360

14 4,348,698
32 4,348,699
60 4,348,700
61 4,348,701
71 4,348,702
77 4,348,703
96.5 4,348,704
98 4,348,705
130.24 4,348,706
132 4,348,707

CLASS 361

45 4,348,708
92 4,348,709
141 4,348,710
182 B1 3,187,234
233 4,348,711
315 4,348,712
4,348,713
328 4,348,714

CLASS 362

109 4,348,715
188 4,348,716
403 4,348,717

CLASS 363

87 4,348,718
132 4,348,719

CLASS 364

200 4,348,720
4,348,721
4,348,722
4,348,723
4,348,724
300 4,348,725
424 4,348,726
431.06 4,348,727
4,348,728
431.12 4,348,729
483 4,348,730
513 4,348,731
571 4,348,732
709 4,348,733
721 4,348,734
724 4,348,735
787 4,348,736
900 4,348,737
4,348,738
4,348,739
4,348,740
4,348,741
4,348,742
4,348,743
4,348,744

CLASS 365

154 4,348,745
182 4,348,746
189 4,348,747

CLASS 366

340 4,348,116

CLASS 367

25	4,348,748
46	4,348,749
106	Re.31,026
140	4,348,750

CLASS 368

82	4,348,751
187	4,348,752
188	4,348,753

CLASS 369

60	4,348,754
155	4,348,755
226	4,348,756

CLASS 370

32	4,348,757
110.2	4,348,758

CLASS 371

20	4,348,759
	4,348,760
21	4,348,761
47	4,348,762

CLASS 372

29	4,348,648
45	4,348,763
58	4,348,764
74	4,348,647
78	4,348,765
89	4,348,766

CLASS 373

30	4,348,767

CLASS 374

24	4,348,117

CLASS 375

26	4,348,768
28	4,348,769

CLASS 376

183	4,348,351
272	4,348,352
364	4,348,353
405	4,348,354
434	4,348,355
461	4,348,356

CLASS 378

112	4,348,590

CLASS 400

54	4,348,118
121	4,348,119
124	4,348,120
166	4,348,121
276	4,348,122
298	4,348,123
	4,348,124
645.1	4,348,125

CLASS 401

135	4,348,126

CLASS 403

9	4,348,127
49	4,348,128
218	4,348,129
231	4,348,130
272	4,348,131
356	4,348,132

CLASS 404

6	4,348,133
129	4,348,134

CLASS 405

36	4,348,135
65	4,348,136
202	4,348,137
297	4,348,138

CLASS 406

10	4,348,139

CLASS 411

103	4,348,140
389	4,348,141

CLASS 414

2	4,348,142
24.5	4,348,143
277	4,348,144
288	4,348,145
332	4,348,146
420	4,348,147
421	4,348,148
458	4,348,149
529	4,348,150
542	4,348,151
785	4,348,152
786	4,348,153

CLASS 416

43	4,348,154
46	4,348,155
48	4,348,156

CLASS 417

40	4,348,158
220	4,348,159
403	4,348,160
	4,348,161
431	4,348,162
462	4,348,163

CLASS 422

22	4,348,357
56	4,348,358
76	4,348,359
122	4,348,360
150	4,348,361
171	4,348,362
192	4,348,363
214	4,348,364
249	4,348,365

CLASS 423

111	4,348,366
139	4,348,367
226	4,348,368
328	4,348,369
362	4,348,370
475	4,348,371
497	4,348,372
522	4,348,373

CLASS 424

1	4,348,374
	4,348,375
	4,348,376
5	4,348,377
7	4,348,378
34	4,348,379
47	4,348,380
52	4,348,381
	4,348,382
70	4,348,383
101	4,348,384
173	4,348,385
177	4,348,386
178	4,348,387
180	4,348,388
228	4,348,389
241	4,348,390
246	4,348,391
	4,348,392
248.57	4,348,393
	4,348,394
250	4,348,395
251	4,348,396
253	4,348,397
258	4,348,398
263	4,348,399
	4,348,400
267	4,348,401
	4,348,402
270	4,348,403
273 R	4,348,404
298	4,348,405
300	4,348,406
	4,348,407
305	4,348,408
308	4,348,409
309	4,348,410
319	4,348,411
322	4,348,412
	4,348,413
327	4,348,414
365	4,348,415

CLASS 425

89	4,348,164
185	4,348,165
310	4,348,166
522	4,348,167

CLASS 426

3	4,348,416
19	4,348,417
104	4,348,418
264	4,348,419
272	4,348,420
394	4,348,421
475	4,348,422
607	4,348,423

CLASS 427

4	4,348,424
8	4,348,425
41	4,348,426
44	4,348,427
54.1	4,348,428
125	4,348,429
215	4,348,430
387	4,348,431
402	4,348,432
423	4,348,433
	4,348,434

CLASS 428

34	4,348,435
35	4,348,436
	4,348,437
36	4,348,438
	4,348,439
41	4,348,440
49	4,348,441
72	4,348,442
122	4,348,443
137	4,348,444
138	4,348,445
144	4,348,312
148	4,348,446
149	4,348,447
157	4,348,448
167	4,348,449
182	4,348,450
203	4,348,451
312.6	4,348,452
333	4,348,453
334	4,348,454
336	4,348,455
	4,348,456
349	4,348,457
366	4,348,458
379	4,348,459
383	4,348,460
409	4,348,461
412	4,348,462
429	4,348,463
571	4,348,464

CLASS 429

27	4,348,465
84	4,348,466
94	4,348,467
193	4,348,468

CLASS 430

55	4,348,469
72	4,348,470
165	4,348,471
195	4,348,472
296	4,348,473
382	4,348,474
399	4,348,475

CLASS 431

9	4,348,168
89	4,348,169
188	4,348,170
202	4,348,171
255	4,348,172
362	4,348,173

CLASS 432

1	4,348,174
241	4,348,175
258	4,348,176

CLASS 433

5	4,348,177
6	4,348,178
7	4,348,179
126	4,348,180
172	4,348,181
214	4,348,182
221	4,348,183

CLASS 434

42	4,348,184
43	4,348,185
44	4,348,186
	4,348,187
72	4,348,188
227	4,348,189
278	4,348,190
308	4,348,191

CLASS 435

123	4,348,476
172	4,348,477
	4,348,478
183	4,348,479
223	4,348,482
234	4,348,480
	4,348,481
255	4,348,483

CLASS 440

38	4,348,192
62	4,348,193
77	4,348,194
100	4,348,195

CLASS 441

40	4,347,635

CLASS 455

164	4,348,770
180	4,348,771
260	4,348,772
326	4,348,773

CLASS 464

11	4,348,196
32	4,347,715
64	4,347,717
83	4,347,716

CLASS 474

28	4,348,197
82	4,348,198
156	4,348,199
160	4,348,200

CLASS 501

45	4,348,484
115	4,348,485

CLASS 518

704	4,348,486
	4,348,487

CLASS 521

115	4,348,488
130	4,348,489

CLASS 523

156	4,348,490
214	4,348,491
336	4,348,309
425	4,348,517

CLASS 524

52	4,348,492
100	4,348,493
110	4,348,308
114	4,348,494
117	4,348,495
127	4,348,496
167	4,348,310
293	4,348,497
530	4,348,311
788	4,348,313

CLASS 525

13	4,348,498
49	4,348,499
65	4,348,500
179	4,348,501
183	4,348,502
439	4,348,314
455	4,348,503
477	4,348,504
504	4,348,505
512	4,348,506

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